Special Supplement: **VALVE DATA BOOKLET**

The Wireless World

4D

THE PRACTICAL RADIO JOURNAL *with* *Complete Foreign Programmes*

Friday, November 3rd, 1933.

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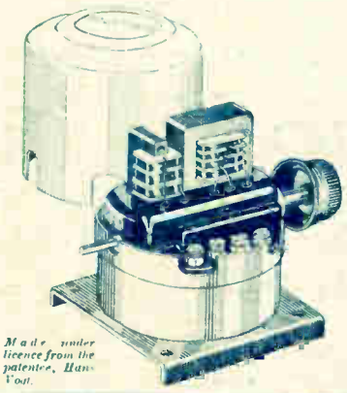

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Intermediate Frequency
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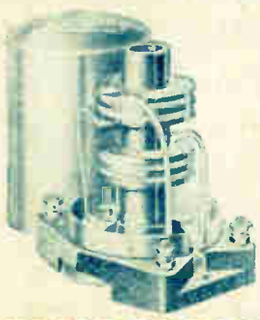

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ALL-BRITISH
CONDENSERS
AND BE
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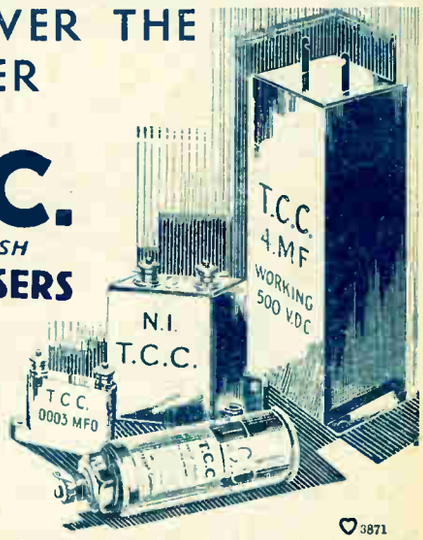

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The Telegraph Condenser Co., Ltd., Wales Farm Road, N. Acton, London, W.3

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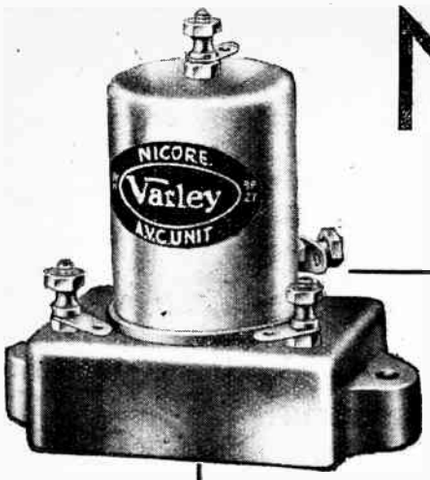

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The Varley Nicore automatic volume control unit can be fitted to any receiver having one or more variable-mu S.G. valves. Connected immediately after the detector valve (second detector with Superhets) in place of the H.F. choke. Easily inserted into the circuit, only four connections being necessary.

B.P.27 - - - 15/6

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Varley
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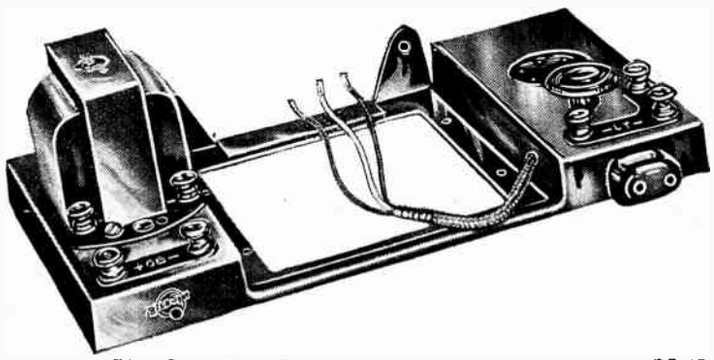
3

New Blue Spot
CLASS B OUTPUT STAGE

The most efficient and ADAPTABLE Class B Unit available



Blue Spot Class B Output Stage, without Valve - 29/6
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SUITABLE for all constructors and all Battery Sets. Particularly suited for all owners of Blue Spot Speakers, both present and recent types. Special adaptor for all 66 R units and 66 R cabinet models.

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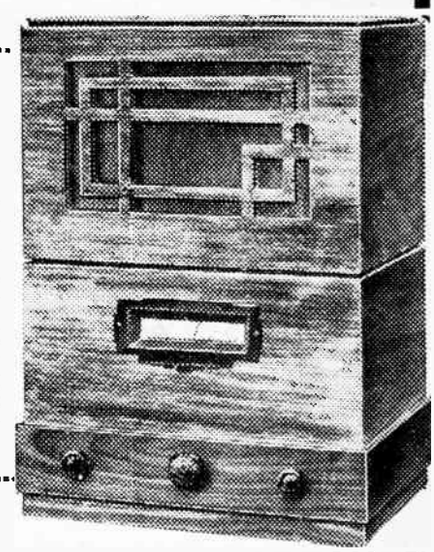

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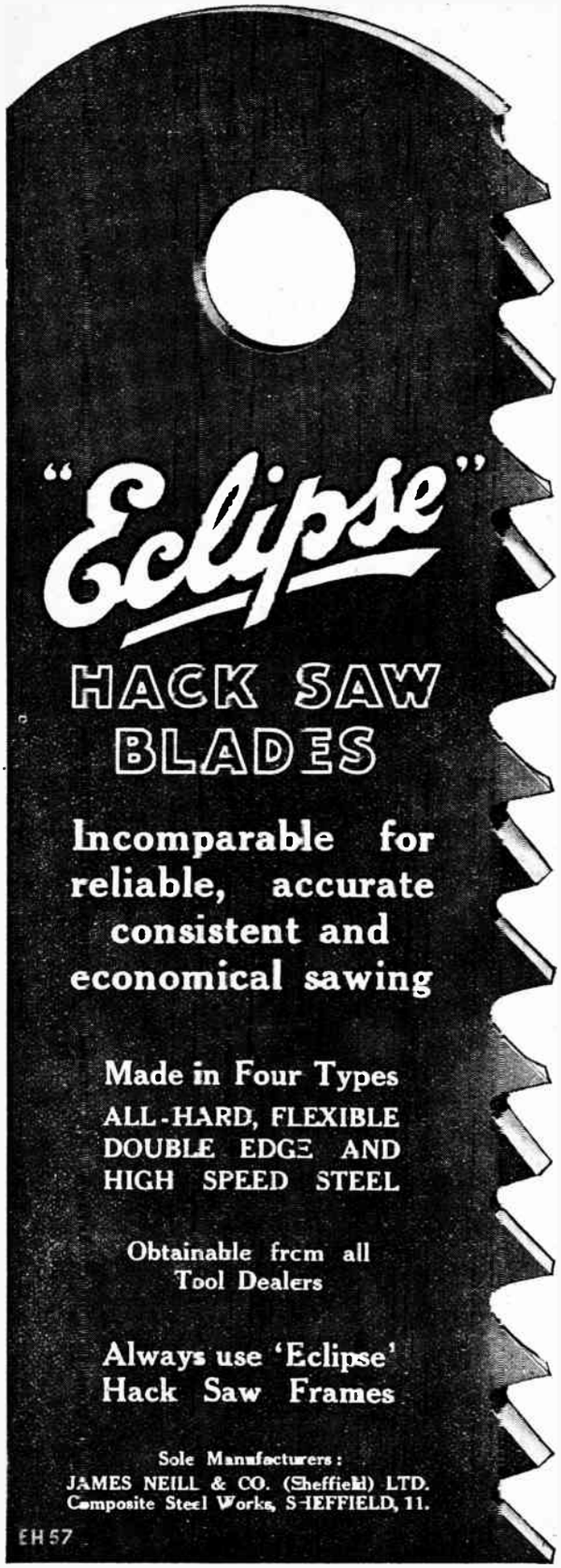

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ratio 1/4 (saves an *EXTRA* 30% H.T.) - **17/6**

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ratios 1/1, 1.5/1, 2/1. High Power Efficiency over 85%. Very low overall secondary resistance. 100 ohms - - **9/6**

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For matching any speaker to Class "B" output - - - - - - - - - **9/6**

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Those who do not wish to interfere with the wiring of their present set can buy this simple unit. Just plug in adaptor to last valve stage and enjoy Class "B" advantages - - - - - - **37/6** *(less valves)*

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The Midget with a MIGHTY VOICE SONOCHORDE

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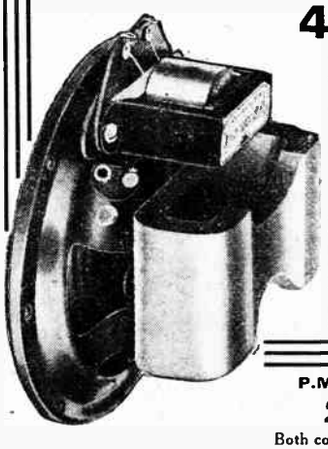
4¼"	5"	2⅝"



The Sonochorde Midget has definitely proved a sensation. Here is the ideal unit for use as a personal extension speaker in the bedroom, study or servant's quarters, or in your portable, midget or automobile receiver. Although small in size, the overall performance is surprisingly fine and, in fact, very far superior to the results which can be secured from speakers of the magnetic type. The Midget is strongly recommended for use where space is limited and the quality of moving coil performance desired. Be sure to specify when ordering whether power or pentode transformer is required, and in the case of D.C. models the field resistance. Both models will handle 1½ watts output without distress. Your dealer will be glad to demonstrate these new revolutionary models. Write for complete Sonochorde catalogue & technical data booklet.

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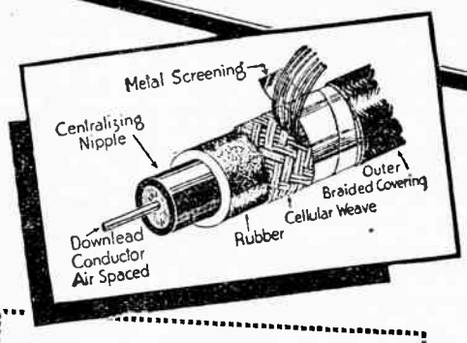
"GOLTONE" METOCEL SCREENED AIR-SPACED FLEXIBLE DOWN-LEAD

Brit. Patent Applied

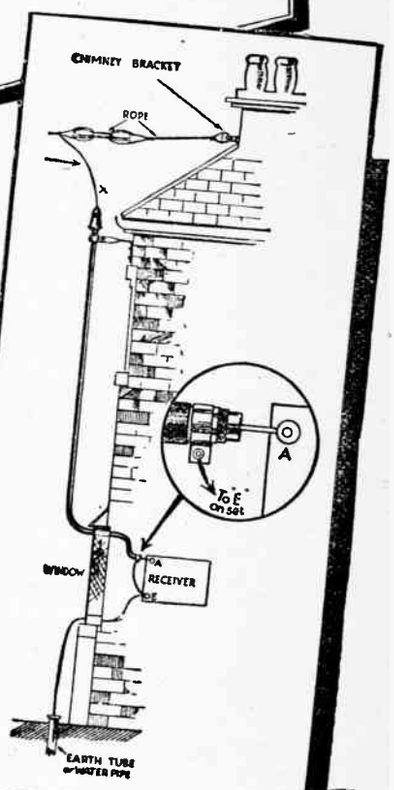


Orders for the "GOLTONE" AIR-SPACED METAL SCREENED DOWN-LEAD, have been received from British and Dominion Governments.

Brings purity of reception, and reduces or removes interference, crackling and humming noises from the receiving set, due to radiation (usually picked up by the down-lead) from domestic and commercial electrical appliances, tramways, electric motors, etc.

The "Goltone" (Patent Applied) Air-Spaced Metal Screened Flexible Down-Lead effectively **solves the problem** by its ingenious design in reducing to a minimum the use of solid matter directly in contact with the lead-in conductor.

A SOLUTION TO YOUR INTERFERENCE PROBLEM.



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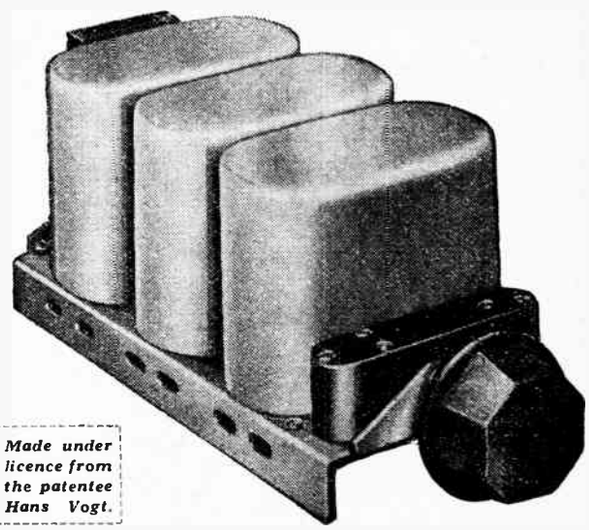

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PHILIPS MAINS TRANSFORMERS,** in perfect order, 210 v. input, output 330-0-330 v. 60 m.a., 4 v. 4 a., 4 v. 2 a., **6/6.** Input 100-240 v., output 250-0-250 v. 60 m.a., 4 v. 3 a., C.T. 4 v. 1 a., **5/-.** Input 210 v., output 200-0-200 v. 30 m.a., 4 v. 3 a., 1 v. 1 a., **3/-.** Input 210 v., output 200-0-200 v. 30 m.a., 4 v. 3 a., C.T. 4 v. 1 a., with screened primary, **4/-.** Eliminator transformer, 210 v. input, output 200-0-200 v. 30 m.a., 4 v. 1 a., **2/6. A NUMBER OF 100 V. TRANSFORMERS, 1/6** each, or **15/-** doz., stampings alone worth treble. **DUAL RANGE A.C. V. METERS,** reading 0-5.5 and 0-275 v., high class job in bakelite case made by a well-known instrument manufacturer, new and boxed, **12/6. SET AND SPEAKER CABINETS,** a variety of designs with panel opening. Inside sizes, 9in.-10in. deep, 14in.-16in. wide by 7in. high. 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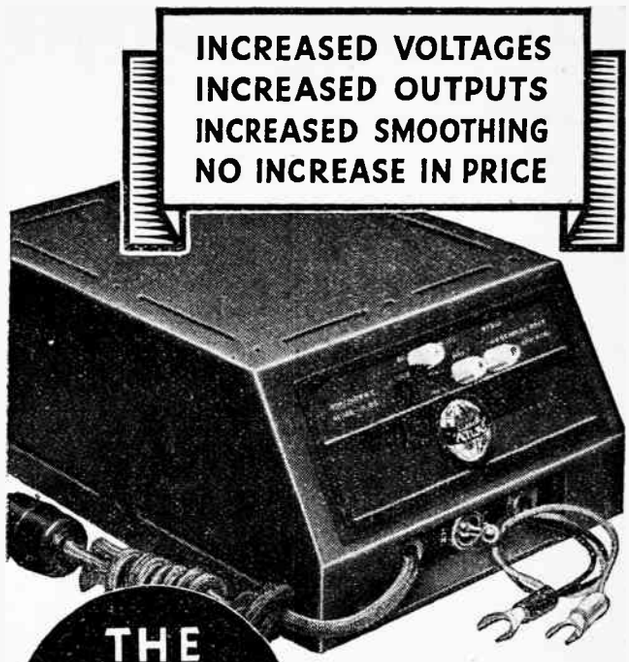

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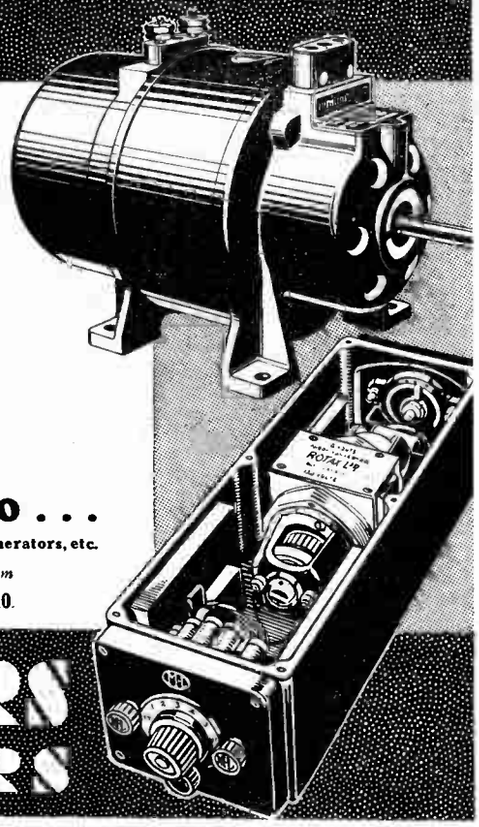

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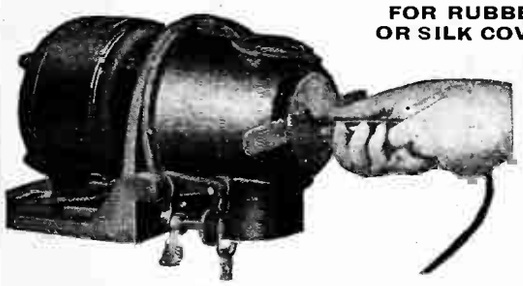

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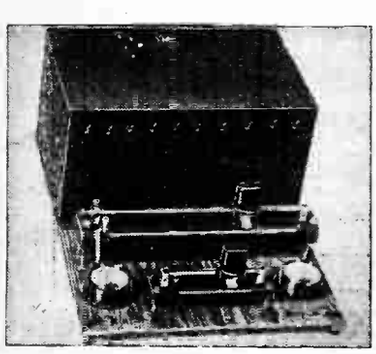

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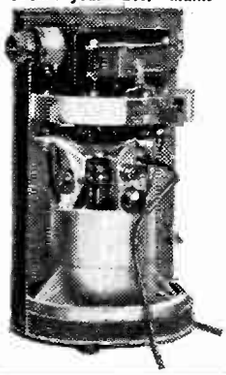

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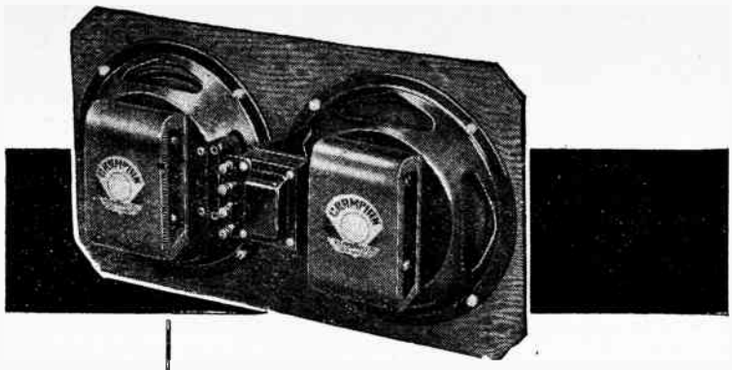

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As many of the circuits and apparatus described in these pages are covered by patents, readers are advised, before making use of them, to satisfy themselves that they would not be infringing patents.

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EDITORIAL COMMENT

Tuning Scales

Importance of Clear Visibility

THE broadcast receiver of to-day is a product of gradual evolution. The earliest sets were generally a collection of component parts wired together on a board. Gradually, for the sake of convenience and as a protection from dust, the components were accommodated in a box with the tuning controls accessible from the outside. In the early sets the principal control was a variable condenser with a scale to indicate tuning positions. Because there were, at the time, only some half a dozen stations to listen to, no great difficulty in tuning was experienced. By degrees improvements were made in the general arrangement of the controls; a reduction in the number of knobs and an increase in the compactness of the receiver being notable landmarks in progress; but the actual changes in the general form of a wireless receiver of to-day compared with that of ten years ago are not very great, although the circuit arrangements have, of course, undergone radical changes.

It is difficult to introduce originality where evolution in design is gradual, and this may be the reason why the tuning indicator has not, in our opinion, received the attention which it deserves. From the practical point of view, simplicity of tuning is one of the first requirements of a modern receiver, and yet nearly all the most modern receivers continue with arrangements for tuning and reading tuning positions almost as unpractical as were those of the earliest sets.

A clock is a good example of a piece of furniture designed for utility; the first thing required is that it should keep good time, and the second that you should be able to see the time distinctly. Is not the same need just as great with a wireless set, where, assuming that the performance of the set is satisfactory, the next most important consideration is the ability to see clearly what stations you are tuning to without having to get down on your knees to examine a small section of the dial through an escutcheon plate, as is too often rendered necessary with present-day designs? Is there any good reason why the area of the tuning device should not be almost the maximum which the dimensions of the cabinet permit? There is room here for radical departure from the standard practice of to-day, and it would be a departure which we feel sure would be widely welcomed by the set user.

Valve Booklet

A Guide to Modern Valves

FOR some years past it has been the practice of *The Wireless World* to issue during the autumn a special supplement giving technical data and general information on current receiving valves of all types. In this issue the information is again included as a special booklet, and in this form it will be found convenient for constant reference. Last year we decided to omit from our supplement information regarding valves of obsolete type, including four- and six-volt battery valves, and expressed the hope, which has since been fulfilled, that manufacturers would follow this example and discontinue listing obsolete valves in their catalogues.

The data in the booklet enables the user to choose his valves intelligently for every purpose, and the importance of having this information readily available cannot be too strongly stressed, particularly since the arrival of so many new and complicated types.

Changing Over to Class "B"

A Worth-while Modification for Battery Sets

ADDITIONS to existing receivers do not in practice always work as nicely as could be wished. But the substitution of a Class "B" output stage is an exception; by observing the precautions simply and clearly described in this article a receiver may be modernised without risk of failure.

THOSE readers who feel happier about starting a job when they are in possession of definite constructional details are perhaps in difficulty about Class "B." Complete Class "B" designs have been presented in these pages; but for each reader who is interested in making an entirely new receiver there are no doubt quite a number who have battery sets that only need a Class "B" output stage to bring them more or less up to date, at a minimum cost. But, just as a sunshine roof intended to be fitted to an Austin Seven would fail to give satisfaction on a Daimler, so some hesitation may be felt in making use of constructional details intended to apply to an entirely different type of receiver. "How can *my* set be converted?" is the question.

The problem has not been made any easier by the appearance of a different type of Class "B" valve in the catalogue of each maker; and, as if that has not made things complicated enough, a variety of different methods are available for using each type of valve. A book of 100 pages would not be too much space in which to discuss all the points involved. People who have no time for that may find the accompanying table helpful.

Sources of H.T. Supply

But first let us discuss power supply. Most of the valves listed can be used effectively on H.T. voltages between 100 and 150. At 100 volts they are hardly working to the best advantage, and cannot compete in output with mains-driven valves. At the other extreme, 150 volts is unnecessarily extravagant for the average home. So everything in the table assumes 120 volts, thus greatly simplifying matters.

The ideal power supply for a Class "B" output is an accumulator battery, because of its steady voltage. But the greatest appeal of the system is to users of the humbler dry battery. There have been attempts to scare such people by pointing out that a peak current as high as 50 milliamps or even more may be taken from the battery, thus imposing a terrible strain on it. The same pessimists may quite probably be carrying a pocket torch, with which they do not scruple to extract 300 milliamps for periods of many seconds, from the smallest type of dry cell. It may be granted, then, that 50 milliamps for a fraction of a second is not so disastrous as is sometimes made out. At the same time, of course, it still remains that a large-cell battery gives better service, other things being equal. But Class "B" does not rule out the ordinary standard size from all consideration.

A typical Class "B" unit, the Burton model.

Then there is the mains power unit. It is possible to produce units capable of running Class "B" stages. Whether there is any sense in doing so is another matter. The economy appeal is entirely lacking, because the unit must be designed to waste all the power that the Class "B" system saves. And, as there is some slight sacrifice in convenience and in quality of reproduction, as compared with a "straight" amplifier, it is rather difficult to see what is the attraction. So our power is a plain ordinary 120-volt dry battery.

Built-in Output Transformers

Then loud speakers; a moving-iron type *can* be used; but it is not really very nice. Now that permanent-magnet moving-coils are no longer luxury goods, one can almost assume them as standard even in economy systems. Most makers include transformers suitable for direct connection to any of the usual valves. You ask for one giving the load specified in column 5 of the table; and it *must* be a Class "B" transformer—one originally designed for push-pull is probably unsuitable because it counted on the core-saturating current being balanced out, which is not done in Class "B."

If you have a loud speaker already, with no suitable transformer, you must find out its working impedance. Then you divide the figure in column 5 by it and take the square-root of the result, which gives the correct step-down ratio for the transformer. Example: impedance of loud speaker, 13 ohms; anode-to-anode load, 12,000 ohms; dividing one by the other gives about 900; square-root, 30. So the transformer, for accurate matching, should have a 30 to 1 ratio.

Another transformer is required to couple the driver valve to the Class "B" valve. It is not wise to be too thrifty when getting these transformers. Much of the success of the system depends on using really first-class transformers, which are not found in the lowest price classes. Undue economy in the purchase department is likely to be rewarded by spurious oscillation and bad quality, and you will spend as much on extra components, trying to make the best of a bad job, as you have saved on the transformers.

The correct ratio for this driver transformer is given in column 11, and refers to the *whole* secondary winding. Sometimes a 1 to 1 ratio is specified as 2 to 1 for the half-secondary, and one must be careful not to go wrong.

Of course, a Class "B" valve is

CHARACTERISTICS OF WELL-KNOWN CLASS "B" VALVES.

Type.	Fila-ment Amps. (All 2-volt).	Grid Bias.	Quies-cent Anode Cur-rent. (mA.)	Anode-to-Anode Load.	Max. Undist. Output Watts.	Driver Valve.	Fil. Amps.	Grid Bias.	Anode Cur-rent. (mA.)	Driver Transr. Ratio.	Max. Signal Input to Driver R.M.S. Volts.
Cossor .. 220B	0.2	Zero	2.5	12,000	1.2	215P	0.15	−10½	1.5	1 to 1	3.0
240B	0.4	Zero	3.0	8,000	2.0	215P	0.15	− 9	2.5	1½ to 1	6.3
Ferranti .. HP2	0.4	Zero	3.0	8,000	2.0	Cossor 215P	0.15	− 9	2.5	1 to 1	6.3
Marconi and Osram. B21	0.2	−4½	1.65	12,000	0.9	L21	0.1	− 4½	1.7	1¾ to 1	3.0
		−4½	1.65	8,000	1.4	LP2	0.2	− 6	2.5	1 to 1	4.9
Mazda .. .. PD220 ..	0.2	Zero	2.0	17,000	1.0	L2	0.1	− 4½	1.5	2 to 1	2.65
		Zero	2.0	11,500	1.4	P220	0.2	− 6	2.5	1½ to 1	4.16
Mullard .. PM2B	0.2	Zero	3.0	14,000	1.25	PM2DX	0.1	− 4½	1.5	1½ to 1	3.0

Changing Over to Class "B"—

needed, too. In selecting this several columns must be considered simultaneously. If you are content with about 1 watt maximum output the filament takes only 0.2 amp. instead of 0.4 for a 2 watt output, and a rather more economical driver valve will do. Another point is that in the B21 (and, optionally, to a less extent in the PD220) bias is used, thus departing from the pure simplicity of the original Class "B" idea. There are

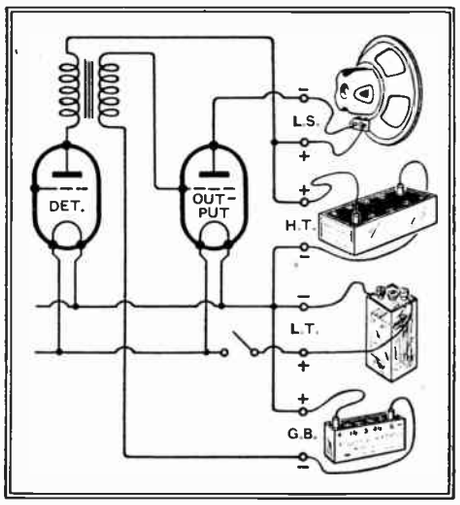


Fig. 1.—The L.F. section of a typical set, which is taken as an example in describing the necessary modifications.

several little complications about this bias—allowances for running-down batteries, and things of that sort. In return it is claimed that better economy and quality are obtainable—in particular that the original waveform of the desired programme is less likely to appear with decorations due to damped oscillation in the circuits. Tests show that this type of distortion is not inevitable in the zero bias system, if good components are used; but readers who are not frightened of complications (this article is addressed chiefly to those who *are*) should be able to get the best out of the system by udicious use of bias. The makers give full particulars about this.

Original Valve as Driver

Having decided on a valve to fit in with your ideas on economy versus power, the data relative to the driver valve can now be noted. There is no need to imagine that this is another valve to buy. Unless the present power valve has just expired, presumably one is all ready to hand. Actually a genuine power valve is rather preferable to the half-and-half types listed in column 7, which have been chosen to be as economical as possible consistent with giving the required output. There is no reason, for example, why a Mullard PM2A should not be used in place of the PM2DX; and it gives a bigger margin against distortion.

There is another reason for using a driver of reasonably low impedance. Although the table data assume 120 volts on that valve, too, a certain amount of decoupling is much to be desired, though not always essential. That means a lower voltage on the driver—say, 90, and the higher impedance types of driver specified are then incapable of delivering the goods to specification.

The table figures can therefore be regarded as giving the most economical conditions; a valve of lower impedance, such as the power valve likely to be already in the last socket of the receiver, is even better, though perhaps not quite so thrifty. The bias should be increased till it takes only 2 or 3 milliamps—if no meter is available, plug into the largest bias which gives satisfactory reproduction. Incidentally, neither table nor makers' curves should be relied on implicitly for bias voltages. Valves vary. Actual trial, preferably measurement, must be made.

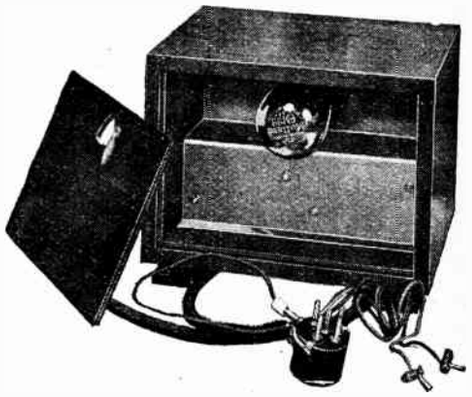
Triode and Pentode Drivers

The driver transformer ratio can go down a step or so if a substantially lower-impedance driver is used. Some examples of this are actually given. The Mazda L2, with 10,000 ohms, takes a 2 to 1 transformer. If the 3,700 ohm P220 is substituted the best ratio becomes $1\frac{1}{2}$ to 1. It is not very difficult to judge a reasonably correct ratio by working on these lines.

It is possible to use a pentode driver. Try it, if you happen to have a pentode and no suitable triode. The transformer ratio may be taken as that applying to a valve of about 12,000 ohms. It may need a little careful doctoring to prevent the quality of reproduction from being altogether too shrill and "edgy." The Class "B" valve, it must be remembered, is equivalent to a pentode in this respect; and two in series are inclined to make this feature rather too pronounced. A tone-control transformer (e.g., the Multitone) is particularly valuable in these circumstances.

The last column is meant to give guidance in deciding what must be used in front of the driver valve to give a strong enough "signal" input. If a valve is used of lower amplification factor than that given in column 7, the signal voltage has to go *up* in inverse proportion.

And, having now chosen the valves and other components, that brings us to the actual circuit alterations to be made to the present set. Remember that what was the output valve is now the driver, and the Class "B" valve is an extra. The type of circuit in which the driver is re-



The Multitone Class "B" unit for adding to an existing set.

sistance-coupled from the detector, though admirable theoretically, is not likely to be found, because the detector would almost certainly be working beyond its ability, with only 120 volts available for everything. A transformer coupling, with the usual ratio of 1 to 3 and upwards, is perhaps the soundest source of the signal volts in column 12. Many sets have an L.F. valve between detector and power valve. If at least one of these is resistance-coupled, it may be passed for use—keeping an eye on extra decoupling if it proves to be needed—but two transformer-coupled stages is not a very promising situation. It is usually unpleasant enough in its original form, and the extra Class "B" stage holds a magnifying glass to its defects. Either cut out a stage entirely, or substitute resistance-coupling in one of them.

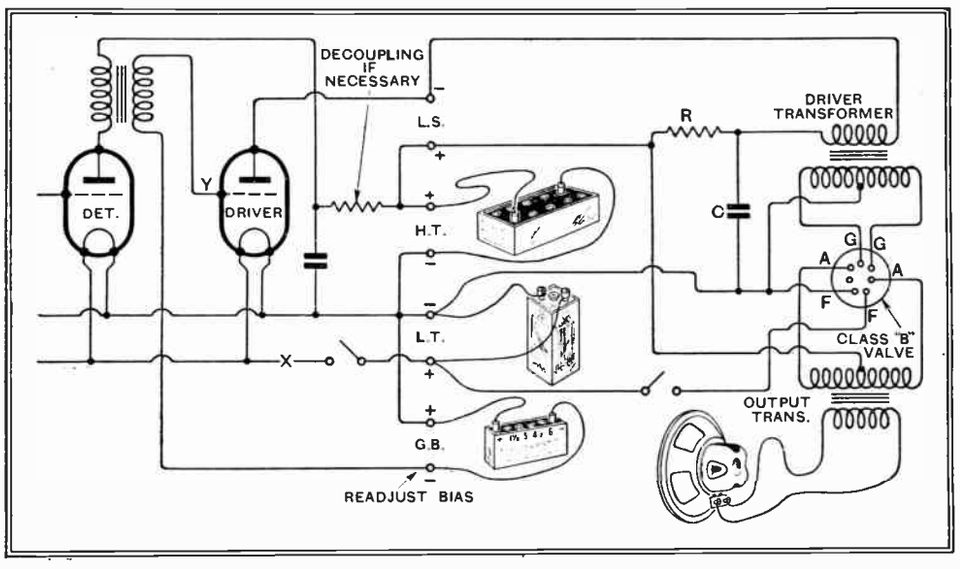


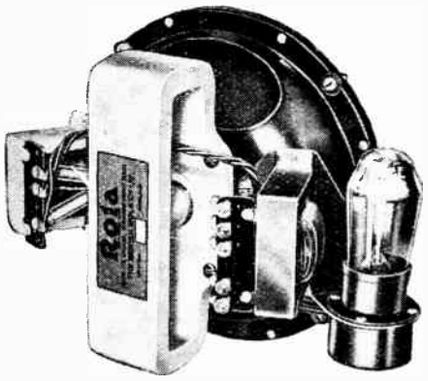
Fig. 2.—A semi-practical wiring plan, showing how to connect the Class "B" valve and components.

Changing Over to Class "B"—

Now for the actual conversion. Fig. 1 shows the hinder parts of a typical battery-driven receiver. Fig. 2 shows the same with Class "B" extensions and alterations. If the last valve but one in Fig. 1 is already decoupled it may be possible to get away without any internal alterations whatsoever, only the grid bias being adjusted to economise in H.T. current. But if no decoupling was used it is most desirable to fit it now; perhaps the previous H.T. voltage was only 100, which means a useful margin of 20 to play with. The resistance may be 10,000 ohms, or 20,000 if an increase has been made in H.T., and the condenser as large as possible, but not less than 2 mfd.

Only four leads need be attached to the Class "B" annex. If the existing L.T. switch is to command the whole apparatus, obviously the positive L.T. lead to the Class "B" valve must be taken to the point X instead of as shown; the second switch is then superfluous. Not all sets are switched exactly so; where there are divergencies from this simple practice it is important to go warily to avoid short-circuiting batteries or blowing valve filaments.

The Class "B" valve-holder connections are shown in worm's-eye view, i.e., as seen from the underneath. Driver de-



Class "B" output stage built on to a loud speaker.

coupling is included—R and C. As already explained, this cannot be allowed with high-impedance economical driver valves, and is not always needful in any case. But if the regular power valve is used it is just as well to include them, as specified for the previous valve. The grid bias may then perhaps be right without any increase. Clearly there is no change in principle if a combined H.T. and bias battery is used. It just means one terminal fewer.

The Class "B" circuit of Fig. 2, apart from the decouplers, is the simplest possible. It is almost certain to be too simple to be satisfactory. First, the tone will probably be too high-pitched. One way of modifying this is to connect a resistance of about 10,000 ohms, in series with a condenser of about 0.01 mfd., across the whole primary of the output transformer, just as for a pentode. This also serves as a safety valve if the loud speaker happens to be disconnected when the valve is working. But, purely as a tone control, it may perhaps be bettered. There is not much point in carefully amplifying an excess of high tones, at cost of valuable H.T., and then just throwing it away. If the tone is controlled somewhere previously, as can be done by using a tone-control driver or intervalve transformer, there is appreciable extra economy.

If the output transformer can be worked absolutely "bare," as shown, so much the better; there is a minimum of distortion such as is introduced by artificially reducing the load by a tone corrector. But sometimes it is found necessary to resort to various dodges to prevent divers sorts of oscillation. The symptoms are harsh reproduction and unduly large standing anode current. If good transformers and well-spaced wiring are adopted there should be no trouble of this sort. The usual cures are condensers and/or resistors shunted across the halves of driver and output transformers. The values depend so much on conditions and components that it is really hard to generalise, and the valve makers kindly supply hints with the valves.

If there is any tendency to upset things in the H.F. circuits, the probable cause is inadequate filtering of the detector output. A useful way of helping to keep H.F. current away from the L.F. end is to insert a resistor of about 0.1 megohm in the lead to the grid of one or both L.F. valves (but *not* the Class "B" valve) at the point Y in Fig. 2.

DISTANT RECEPTION NOTES

Heterodyne Peculiarities : Daylight Concerts from Abroad

MYSTERY surrounds the station which is causing so much trouble with Huizen. Though the authorities of the Dutch station themselves state that the interloper is the Roumanian station Brasov, I see that in the latest U.I.R. report it is called a Soviet transmitter.

Heterodynes are surprising things. One might, for instance, expect that Huizen would be bothered by both the 7-kilowatt Kaunas, 5 kilocycles below, and the 40-kilowatt Lahti, 7 kilocycles above. Both of these stations are in regular operation, as the U.I.R. report shows, but it is very seldom that even the ghost of a whistle due to them is heard.

The "Record" in Whistles

Then Oslo. The 10-kilowatt Tiflis is working just now barely 4 kilocycles above the Norwegian station, whilst the 35-kilowatt Minsk is but 6 kilocycles below it. Yet, except on rare occasions, Oslo is not now heterodyned. Against these may be set last year's "record" heterodyne, when a Siberian station heterodyned Kalundborg nearly 3,000 miles away.

Good as it is now, transatlantic reception should be vastly better before the winter is over, for numerous American stations are bringing their power up to 50 kilowatts. This is the highest output rating allowed in the United States, and at present the number of transmitters using it at any one time is only nineteen. There are more 50-kilowatt stations than this, but several of them work in pairs on the same wavelength, one being silent whilst the other is transmitting. When the new scheme is complete there will be more than thirty 50-kilowatt stations in simultaneous operation.

The only exception to the 50-kilowatt rule in WLW, Cincinnati, which is being allowed to erect a 500-kilowatt station. I hear from America that tests are to begin shortly. The results will be closely followed by the Federal Radio Commission, which will make the final decision.

With its present 60 kilowatts, Beromünster is often an extraordinarily good daylight transmission in this country. It is shortly to go up to at least 100 kilowatts. When the new plant is in operation this country should be to all intents and purposes within its service area. The power of Söttens is to be increased also from 25 to 75 kilowatts.

It is reported that the French Government intends to compel both Toulouse Midi and Fécamp to close down. Seeing that Fécamp is now officially radiating 700 watts I imagine that it will still come through fairly well even when "completely closed down!" The French Government's dealings with its broadcasting stations always remind me of the description of the alleged trained dog: "One word from his master and he does . . . exactly what he likes!"

Atmospherics are now mercifully absent and long-distance reception may be pursued under almost ideal conditions. There is a certain amount of heterodyning on both wavebands, but the choice of stations is none the less a large one. Those best worth attention on the long waveband are Radio-Paris, Zeesen, Warsaw and Oslo. On the medium waves Budapest, Prague, Langenberg, Rome, Leipzig, Strasbourg, Breslau, Hilversum, Heilsberg and Nürnberg are outstanding.

D. EXER.

A ROYAL RECORD

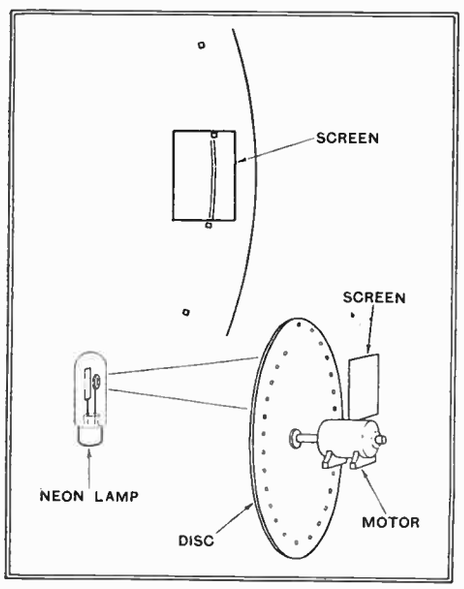
H.R.H. Prince George pressing a record of the Prince of Wales' voice during a recent visit to the H.M.V factories at Hayes. The royal guest spent several hours in studying all the processes of radiogramophone and record manufacture.

Television Explained

II.—The Transmitter and Receiver

THIS is the second of a series of articles intended to outline the general principles of Television and proceeding, in later instalments, to an explanation of the various individual systems now being developed.

IN Part I of this series it was shown how the picture to be televised is converted into a series of strips and the light variations along these made to produce a varying current in a photo-cell. Although this current is strictly speaking uni-directional, it may be considered as being an alternating current superimposed upon a steady direct current, just as we make the same assumption in the case of the anode current of any valve. The photo-cell output, therefore, can be considered as an alternating current, which is strictly analogous to the current output of a microphone used in sound transmission.



The upper portion of this drawing shows the manner in which the holes in the scanning disc pass over the viewing screen, while the lower portion illustrates the arrangement of the apparatus. The light from the neon tube passes through the holes in the disc and falls on the screen. The position of the spot of light at any instant is determined by the precise position of the disc.

The photo-cell output can thus be treated in exactly the same way as the output of a microphone; it is amplified to the requisite degree, and then used to modulate the carrier of the transmitter. Such differences as may occur in practice are due merely to the different frequencies involved in television as compared with sound broadcasting. Instead of the range of modulation frequencies being from 30 cycles to 10,000 cycles, in the case of television it may be from 12½ cycles to 300,000 cycles or more, depending upon the precise details of the television equipment.

In the receiver there is again no difference, apart from the different range of modulation frequencies involved. H.F. amplification, detection, and L.F. amplification are all necessary and follow standard practice. In fact, the equipment necessary for television is fundamentally the same as that used for sound broadcasting, save that at the transmitter suitable optical apparatus and the photo-cell replace the microphone, and at the receiver a light source and optical apparatus replace the loud speaker. For the present, therefore, we need not consider the electrical circuits of transmitter and receiver, and we can turn directly to the television "loud speaker."

Primarily, this consists of a light source of such nature that the light intensity is proportional to the operating current, and which is capable of responding instantaneously to rapid variations in the current. This last requirement rules out all ordinary lamps, and it is usual to employ a neon tube, although other and more efficient methods have been developed. The lamp is commonly connected in the anode circuit of the output valve of the receiver, and the steady anode current passes through it. In the absence of a signal, therefore, the lamp gives out a steady light the intensity of which depends upon the value of the anode current, and which can be controlled by varying the anode current.

The Scanning Disc

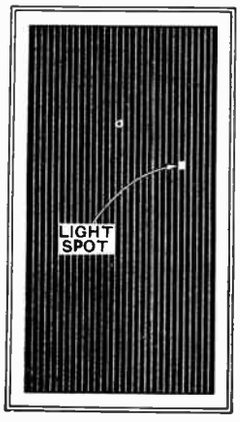
The television signal causes fluctuations in this steady current, and the light then varies in sympathy. If we look directly at the lamp, therefore, we can see all the light variations of the transmitted picture, but they do not form any intelligible picture because the picture has been broken up into a series of strips at the transmitter, and it is necessary to reassemble these at the receiver.

This is carried out by means of a Nipkow disc, the whole process being exactly the reverse of that at the transmitter. The disc is interposed between the viewing screen and the neon tube, as shown in Fig. 1, and matters are arranged so that the light from the tube can fall upon the screen through only one hole at a time. The disc must be identical with that used at the transmitter, and it must rotate at exactly the same speed; furthermore, at the instant when any one hole is just commencing to scan the picture, the corresponding hole at the transmitter must also be just commencing to scan the picture. In this way the strips into which the picture was broken at the transmitter are reconstituted in their correct relative positions at the receiver, and the picture can be seen on the screen.

It will be seen that the difficulties involved are two—the attainment of exact synchronisation of the discs, and obtaining sufficient illumination. Taking the latter first: in a cinema, if there are ten pictures a second, each picture is fully illuminated for rather less than one-tenth of a second. The televised picture, however, for the same picture frequency, requires a much stronger light source for the same illumination, for at any instant there is only one small spot of light on the screen. This will be seen from Fig. 2, which illustrates the traverse of the light spot at the receiver. This small spot covers the whole picture in one-tenth of a second, and consequently it must be of extraordinary brilliance if the whole picture is to appear in any detail.

A concrete example may serve to emphasise the importance of this point. Assuming for simplicity that there are ten pictures a second in a cinema, each picture is completely illuminated for a twentieth of a second, if the interval between successive pictures is equal to the duration of each picture. With television equipment there is no interval, but the area of the light spot is only about 1/2,000 of the picture area, so that any given portion is illuminated for only 1/20,000 of a second. The increase in illumination required, therefore, will be readily apparent.

It is on the score of brilliance that the neon tube is apt to fail as a light source in a television receiver, but nevertheless it is possible to obtain quite good results with it, although there are now better methods available. The chief difficulty lies in synchronising, for the degree of accuracy required is so high as to necessitate a definite linking of the transmitter and receiver. Synchronising is really a whole subject in itself, and it will be dealt with briefly in the next article of this series.



At any instant the picture consists of no more than a single minute spot of light, but, owing to the retentivity of the eye, the movements of this cannot be distinguished, and the effect of a steady picture is obtained.

The Cathode-ray Oscillograph

What It Is and How It Works

By A. L. M. SOWERBY, M.Sc.

THE cathode-ray oscillograph is becoming more and more important in its applications to investigating what happens in wireless circuits, and particularly in indicating wave form and distortion. One of the most important applications of the cathode ray tube is, however, its use in television systems. The purpose of the present article is to give the reader a clear idea of the principle of operation of the tube, in order to pave the way for a better understanding of television circuits where the tube is employed.

WHEN receiving an ordinary wireless signal the valves in the receiver have to deal with currents that may change their direction several million times in a second. Between each reversal of direction and the next, there is a continual variation in the intensity of the current, and the valve is called upon, if it is to amplify without distortion, to follow even this finer detail of an immensely rapid phenomenon.

The current is carried through the valve by electrons, which are particles of more or less material type flying, under the influence of the various voltages applied to the electrodes, through the evacuated space. The inconceivable rapidity of their response to the fluctuations of the voltages applied is a graphic demonstration of their extreme smallness and almost complete lack of inertia.

In the valve, although the flying electrons respond to the fluctuations of voltage on the grid, there is no satisfactory means of observing this response. The only way in which the variations of current can be made visible is by connecting a milliammeter in series with the valve, and though the milliammeter will indicate faithfully enough any *slow* changes in current, the mechanical inertia of its

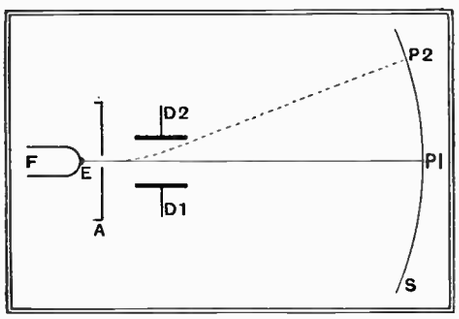


Fig. 1.—Electrodes and screen of a crude oscillograph tube, illustrating the principles of operation.

moving parts (coil, pointer, and so forth) make it quite impossible for it to follow changes in currents which are varying at any really high speed. By choosing a mechanical indicating instrument we lose, in fact, all the advantages that the instant response of the electrons seemed to offer.

The cathode-ray oscillograph is, in essence, a type of valve in which the electrons are themselves made visible, so that their movements, no matter how rapid they may be, can be followed by the eye. Though the electrons are far too small to be seen, individually or in groups, the energy they carry, especially when travelling really fast, is fairly considerable. A thin beam of electrons, arriving at a point with a velocity acquired by being made to pass through a thousand-volt field, carries power equivalent in magnitude to that dissipated by a glow-worm or other faint but readily visible light-source.

Conversion into Light

The problem of converting the electro-mechanical energy of the flying electrons into light, in order that their energy may be directly appreciated by the senses, is solved by the fluorescent screen. This consists of a thin layer of suitably prepared calcium tungstate or zinc silicate coated upon glass or other support. When a beam of high-velocity electrons strikes such a screen, the electrons are stopped and the energy of the flight is largely converted into light. The arrival of the electrons is thus made visible by the appearance of a glow upon the screen, the size and shape of the glow corresponding to the area upon which the electrons are impinging.

In a valve, variations in the voltages applied to the control-electrode (the grid) are represented in the anode circuit by variations in current—that is, by variations in the number of electrons arriving at the anode in each second. Such variations, if made visible with the aid of a fluorescent screen, would show up as fluctuations in brilliance of the patch of light—a type of change to which the eye is extremely insensitive. The construction of an electron-tube designed to enable

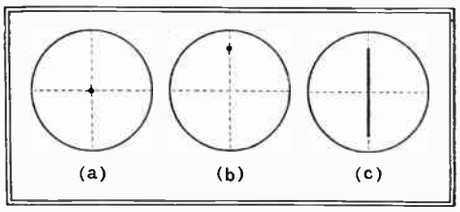
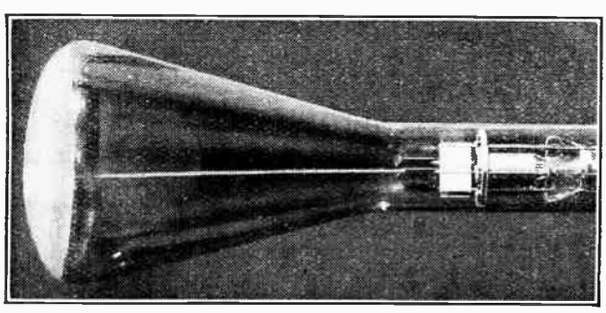


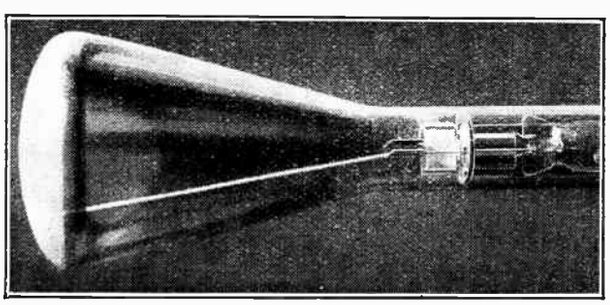
Fig. 2.—Appearance of the screen of the tube of Fig. 1. (a) When no voltage is applied to the deflector plates. (b) When a steady voltage is applied to the deflector plates. (c) When an alternating voltage is applied to the deflector plates.

rapidly varying voltages to be studied by visual examination must, therefore, be different from that of a valve, the design being directed towards *deflecting* the electrons in their flight in a manner depending upon the voltage instead of varying the number of them passing through the tube. By this means the changes in the voltage to be studied are seen as movements of a point of light across the fluorescent screen.

How this end is achieved will best be seen by studying the electrode-arrangement of a cathode-ray oscillograph. Fig. 1 shows the essentials of a simple tube in diagrammatic form. The filament F, on which there is at E a single spot of emitting material, is heated by a battery, with the result that electrons are emitted from E. From this point they would fan out in all directions, as light is radiated from a single bright point, were it not for the fact that a high positive voltage



Two actual photographs showing the projected beam of electrons. The beam in its normal position is shown on the left, whilst the effect of deflecting the beam is represented on the right.



The Cathode-ray Oscillograph—

is applied to the anode A. This consists of a sheet of metal pierced with a small pinhole opposite the emitting point E. The electrons from E are drawn violently to A by its high positive voltage, arriving

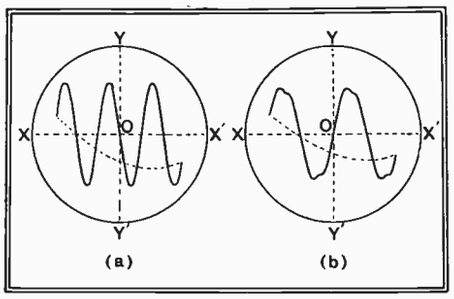


Fig. 3.—(a) The trace of an oscillograph screen produced by combining an alternating voltage (vertical scale) with a linear horizontal traverse (time-base). (b) The same, for an alternating voltage of bad wave form.

upon it at very high speed. A certain number fly through the pinhole at this high velocity, and, passing between the two *deflector plates* D_1 and D_2, arrive eventually at P_1 on the fluorescent screen S, where a visible spot of light appears.

If D_1 and D_2 are held at the same potential as the anode A, the beam of electrons suffers in passing between them neither a change in velocity nor any deviation from its original path. But if D_1 is made more negative than the anode, D_2 remaining at anode potential, D_2 will attract the electrons more during their flight than will D_1, with the result that they will take a path such as that shown in dotted line, and will arrive eventually at the point P_2 on the screen. In addition, since the mean potential of D_1 and D_2 is now lower than when they were both connected to A, the velocity of the electrons comprising the beam will have dropped a little, which will increase the distance P_1P_2, since a more slowly travelling electron is naturally more readily deflected. This means that if a succession of voltages are applied to D_1 the resulting deflections of the spot of light will not be exactly proportional to the voltages, each additional volt having a little more effect than the last. By splitting the deflecting voltage, making D_2 positive while D_1 is made negative, the mean potential of the two can be kept the same as that of the anode; the same change of voltage will then result in the same deflection at all points on the screen.

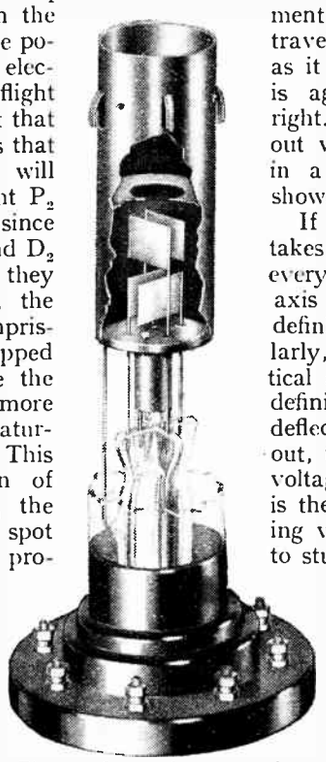


Fig. 4.—Internal construction of Cossor cathode-ray oscillograph. Bulb and fluorescent screen not shown.

Instead of a steady voltage we may apply an alternating voltage between the deflector plates. The spot of light on the screen will then fly backwards and forwards at the frequency of the voltage applied, tracing out a line on the screen. This line, centring on P_1, will indicate by its length the magnitude of the voltage, but persistence of vision, together with some "afterglow" from the screen, will prevent the eye from following the rapid to-and-fro movement of the spot.

The appearance of the screen resulting from the application to the deflector-plates of zero voltage, a steady voltage, and an alternating voltage can be seen from Fig. 2.

The Time Base

If a cathode-ray tube is to be of any real service in studying an alternating voltage the line of Fig. 2c must be developed into some more informative figure. This line is produced by the rhythmic up-and-down movement of the spot of light, which follows faithfully at every instant the voltage applied to the deflector plates. Let us suppose that the spot of light is given a horizontal movement independent of the vertical movement we are trying to study, and let us further suppose that this horizontal movement consists of a single trip across the screen at constant velocity from left to right. The up-and-down movement still continues, but the added left-to-right movement means that as the spot moves upwards the path it traces out is no longer vertical, but is slanted over to the right, the slant increasing as the spot slows towards the end of its travel. At the moment when the upward movement has ceased and the downward movement is about to begin the travel is purely horizontal, while as it comes downwards the path is again deflected towards the right. The whole pattern traced out will be seen by an observer in a form something like that shown in Fig. 3a.

If the left-to-right movement takes place at constant velocity every inch along the horizontal axis XOX′ represents some definite period of time. Similarly, every inch along the vertical axis YOY′ represents some definite voltages applied to the deflector-plates; the curve traced out, therefore, is a graph of this voltage plotted against time. It is the *waveform* of the alternating voltage we have been trying to study. In Fig. 3a a more or less conventional "sine-wave" is shown, but we may find that the voltage in which we are interested contains components of several different frequencies, in which case some "distorted" wave, such as the remarkably bad specimen exhibited in Fig. 3b, may make its appearance on the screen. The distortion may be then traced to its source and eliminated, if such is the purpose for which the alternating voltage is being examined.

The second sweep of the electron-beam, that from left to right, requires a second pair of deflector-plates set at right-angles to the single pair indicated in Fig. 1. The photograph of Fig. 4 shows the electrode assembly of an actual cathode-ray tube, and shows very clearly the two pairs of deflector-plates one above the other. Immediately below them is the anode, the central hole in which is clearly visible. Round the filament is a cylindrical electrode, usually known as the *shield*, to which in practice a negative potential is applied. The effect of this, combined with a small amount of an inert gas within the tube, is to assist in focusing the electron beam so as to give a small spot rather than an ill-defined bright patch on the screen, and hence to provide figures traced out by a thin, clear line. A further effect of the shield is to increase the number of electrons passing through the anode hole.

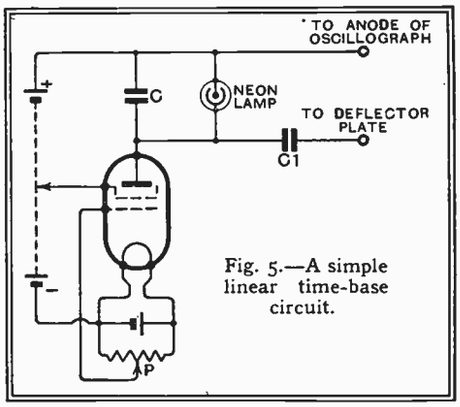


Fig. 5.—A simple linear time-base circuit.

For providing the voltage applied to the second pair of deflector-plates to give the left-to-right sweep of the beam a "time-base circuit" is required. In one of its simplest forms this may consist of a condenser C shunted by a neon lamp (Fig. 5), together with means for charging the condenser from a steady current source. When the voltage across C, receiving a charge from the battery, rises to the striking voltage of the neon lamp the latter lights, thereby drawing a current which discharges C to the voltage at which the lamp will no longer stay alight. Recharge to the striking voltage then begins again, and so the process continues, the voltage on C showing in continuous succession a slow rise followed by a sudden drop. The slow rise is used to carry the spot from left to right across the screen, while the sudden drop sends it back at high velocity to begin its traverse over again.

The current through the screen-grid valve used as constant-current device may be controlled by adjustment of the grid-bias potentiometer P; this, in conjunction with the choice of screen voltage, allows the rate at which occurs the charge and discharge of the condenser to be controlled. By making this process take, say, three times the period of a single cycle of the alternating voltage under examination, three complete waves of this voltage appear on the screen. But it will be appreciated that it will only be when the three-to-one ratio is absolutely exact that successive repetitions of the picture will occupy exactly the same place on the screen; a slight variation from the intended ratio will cause the waves seen to progress steadily across the screen as each successive figure makes its appearance a shade to right or left of the last.

The Catkin in the Making

A bank of Osram "Catkin" valves minus their metal shields.

THE metallised valve has wrought a revolution in factory methods, as can be judged from this description of the fascinating new processes involved in making Osram "Catkin" valves. The illustrations show how the advent of the metal valve has facilitated the use of mass-production methods.

True-to-type Valves by New Methods in Hammersmith Factory

WHEN the Catkin valve made its sudden appearance in May last, and showed at a glance that there *could* be something new under the sun, it fully warranted the eager interest aroused on all sides. There had been achieved a radical departure from orthodox methods of manufacture; the M.O. Valve Co., producers of the new valve, had abandoned the traditional lamp form of construction and had struck out with a design which was not only original but sound.

Strangely new designs involve strangely new methods of manufacture, and it is with such methods that this article concerns itself. A visit to the Hammersmith works where Osram (Catkin) valves are made reveals a new world to the man familiar with the valve-manufacturing methods of the last fifteen years.

The essential differences between the Catkin and the glass valve will bear repetition. They are as follows:—

(1) The abolition of a glass "pinch" and its substitution by a mica insulated steel clamp.

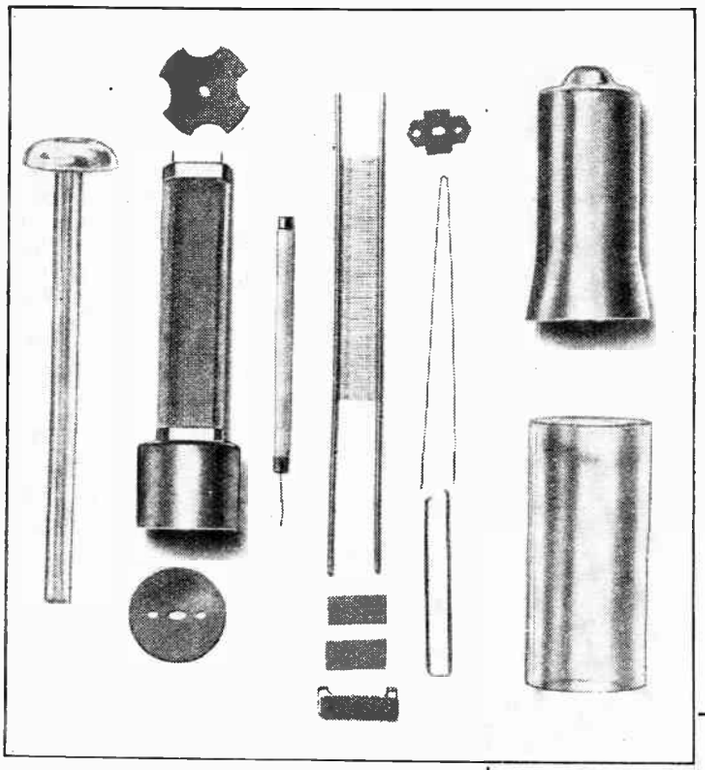
(2) The abolition of bent and welded wires in the electrode support system and substitution of strong, straight supports which are rigidly held in the steel clamp.

(3) The use of a new form of circular seal, round the circumference of which the leading in wires are spaced.

(4) The possibility of eliminating the glass bulb and substituting an air-cooled anode forming the exterior envelope of the valve. (This principle has been adopted for many years with success on large transmitting valves dissipating the equivalent of many kilowatts in heat.)

(5) The abolition of capping paste and substitution of a rubber ring in a metal shell.

(6) The substitution of a ventilated metal outer container in place of the metallised bulb.



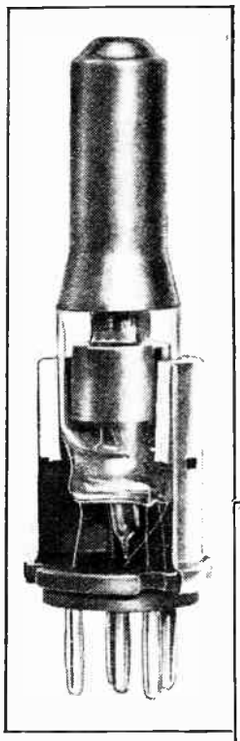
A complete set of components for an A.C. screen-grid "Catkin." On the right is an unshielded specimen with a metal shield ready for fitting.

Let us see how these various processes are carried out. The accompanying illustration shows the complete set of components for the A.C. screen-grid valve. The mixture of strontium and barium oxide normally used as an electron-emitting material coated on the nickel-plated cathode in indirectly heated valves is improved upon in the Catkin. The cathode can thus be run at a lower temperature, allowing the use of larger inter-electrode clearances and leading to greater uniformity. An illustration opposite shows the cathodes being sprayed. The cathode is supported axially in the control grid by two mica insulators, the central holes of which locate the cathode, while the grid wires pass through other holes. The control grid, similar to that used in glass valves, is welded to straight support wires which, after passing through the holes in the mica, are slightly flattened to retain the mica in position.

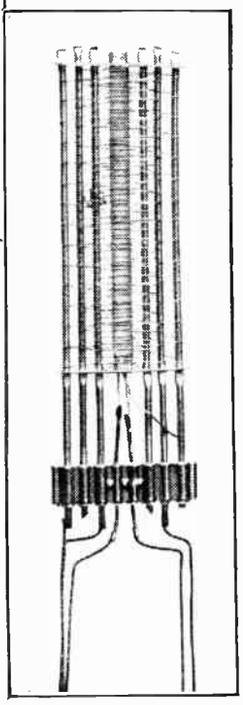
Now comes the insertion of the tungsten heater inside the cathode. The heater is welded to support wires, this and the weld to the cathode lead being the only welds in the electrode support system. A

The Catkin in the Making.—specially prepared steel and mica clamp is now pressed around the electrode assembly. This finished clamp is shown in the photograph below. Copper-clad nickel-steel wires are welded to the electrode supports below this clamp, and we now have a complete electrode assembly for an MH4 triode valve, the unit being ready for insertion into the copper anode.

The construction does not vary very much in the case of different types. With the screen-grid valves VMS4 and MS4B the top mica fits inside the top of the screen while the bottom mica fits inside and abuts against the shoulder of the extended cylindrical skirt, thus rigidly determining the position of the grid cathode assembly within the screen. The screen itself is hexagonal, and has solid sides to give the minimum grid-anode capacity. Another mica insulator is now attached to the top of the screen and the completed assembly passes within the copper anode with its glass foot tube.

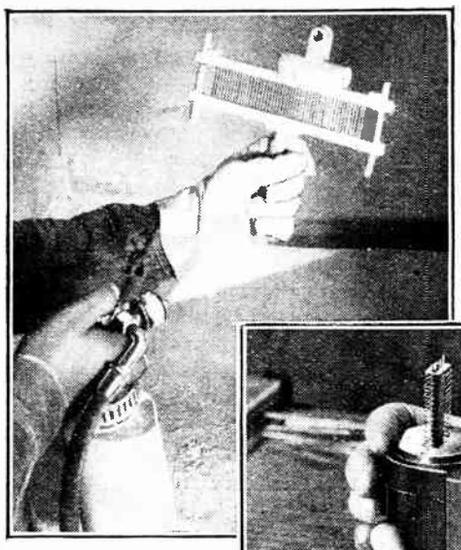


Sectional photograph showing the rubber ring method of capping. The right-hand picture shows the control grid, cathode and heater assembly with steel-mica clamp.



Whatever the particular type of valve this method of construction obviously ensures great accuracy in the registration of the various electrodes.

The copper anodes of Catkin valves are solid drawn from copper sheet, and the dimensions can thus be maintained within much closer limits than by the usual method of stamping and welding blanks on thin material. A large factor of safety at working temperatures is secured by reason of the fact that the copper is of sufficient thickness to withstand atmospheric pressure at the high temperatures used in the exhausting processes.



Above: How the cathodes are sprayed in Osram "Catkin" A.C. valves. Right: One of the jigs used to ensure accuracy of spacing in assembling the electrodes.

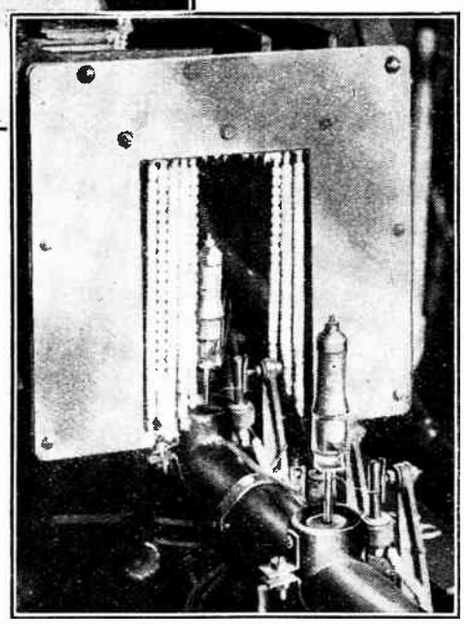
The only glass used in a Catkin valve is the glass foot tube employed to provide the necessary insulation at the lead-in wires.

In joining the glass to the copper anode the open end of the anode is slightly flared and the edge tapered where it is joined to the glass; this thin edge and the end of the glass tube are made red hot in a gas flame and then brought together. In this way a join is formed which, after suitable annealing in a special electrical oven, is both vacuum tight and very strong. In spite of the differences in expansion of the glass and the copper, this join will stand large changes in temperature owing to the ductility of the thin copper flange. The electrode assembly is now inserted into the anode, and the open end of the glass tube is closed by sealing into it a specially shaped exhaust tube not unlike a mushroom. Such tubes are shown in the accompanying photograph.

Pumping and Seasoning

Copper anode, glass foot tube and mushroom-shaped exhaust tube are carefully gauged and graded to ensure accurate joining on the machines, which are quite novel in design and construction. The advantage of this annular seal is that the spacing between the lead-in wires is the maximum attainable for a valve of given diameter, and the insulation between them is thus perfect. Now follows the pumping process. Any evolution of gas during the life of a valve will lead to failure, and it is thus essential to remove all the occluded gases. To do this thoroughly each part of the valve must be heated to a much higher temperature during pumping than it attains while operating. Fortunately, however, the construction, with its air-cooled metal anode, permits of the application of much higher temperatures than can be applied with glass valves, thus making possible a higher degree of evacuation.

After sealing off from the pump the valve has to be capped before going through the seasoning and ageing processes. In a new method of capping evolved for the Catkin valve, the base is attached by means of a compressed rubber ring. Rubber has the property of adhering more and more firmly to the glass as time goes on. And this method removes the risk of loose bases. The rubber mounting also helps to protect the valve from external vibration and consequent microphonic noise.



Preparatory to sealing off. "Catkin" valves entering the baking oven on a round table pump.

A photograph on this page shows the method. The metal shell has a thin rubber ring held between the groove and the flanged top under which the valve is inserted in the press. A bakelite insert carrying the usual pin arrangement is introduced at the other end of the shield, which is spun over so as to retain it permanently in position. When one of these pins forms the anode terminal, connection is made by a wire brought down inside the rubber from a metal ring gripping the anode. In the screen-grid valve, where the anode terminal is at the top, this takes the form of a brass cup which makes direct and permanent contact with the anode. In those valves in which the external metal container is omitted,

The Catkin in the Making—
the anode is coated with an external layer of black enamel, which is heat resisting and a perfect insulator. In operation the anode runs at a perfectly safe temperature with or without this enamel coating, but the coating, being black, naturally increases the cooling. The majority of valves, however, require the metal shield to provide electrostatic screening.

In the Catkin a metal shield, shown in the illustration on page 358, is placed over the entire valve and spun on a base so as to fix it permanently. The sides of the shield are perforated to allow free circulation of air to the anode, and it is claimed that this shield gives more perfect screening than sprayed metal, while the sides, of course, protect the valve from damage.

Each valve is submitted to stringent tests for filament continuity and current anode current, mutual conductance, insulation, etc., and the feature of these tests is the uniformity of results which is inevitable by reason of the precise and rigid manner of construction.

If the listener is happy to have an unbreakable valve so is the packing department at Hammersmith. Elaborate packing is now unnecessary and the cartons can be much reduced in size. The set-maker is happy because no separate valve padding is needed, and, indeed, the set can be despatched complete with Catkin valves ready in their correct positions.

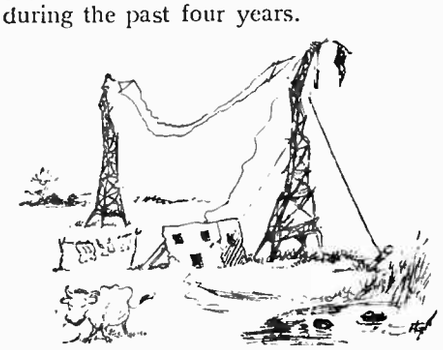
UNBIASED

By FREE GRID

Second-hand

I AM not personally very well acquainted with the good folk whose happy fate it is to dwell in the Midlands, but, unless they are the meekest and most spineless set of morons, they will certainly be up in arms against the latest decision of the B.B.C. Moguls at Portland Place.

It is well known that when the new National transmitter opens at Droitwich next year the local Nationals are to be closed down and at the same time the Midlands are to be supplied with a brand new regional transmitter. At any rate, the Midlanders imagine that it is going to be brand new, little wotting of the fact that, according to a well-known "daily," the B.B.C. are conspiring to palm off on them second-hand goods in the shape of the ricketty old affair that has gallantly held the "National" fort at Brookmans Park during the past four years.



Rickety old affair.

Now I have previously pointed out in these columns (May 12th, 1933) that, according to strict actuarial tables, the normal expectation of life of a broadcasting transmitter is five years, after which it is so archaic, owing to modern developments, that it is fit only for the Science Museum at South Kensington.

If the B.B.C. engineers try to tell us that a 1929 transmitter is still fully up to date, then their Research Department must compare unfavourably with those of certain component manufacturers whom I would like to mention, but mustn't.

Follow the Arrow

THERE is one thing in the way of publicity which both the London and the Manchester show authorities might well borrow from Glasgow. I refer to the truly nobby idea of decorating every tram standard with a brightly coloured arrow labelled "Radio" and pointing the route to be followed to get to the Exhibition Hall. The idea needs some improvement, however, for, as it was, it nearly landed me in a somewhat undignified situation.

As I came out of the Central Station at Glasgow I dutifully followed the arrows up hill and down dale for fully a mile until I came to the last. This pointed compellingly towards an attractive entrance way into which I barged without hesitation. I presented my "Kelvin Hall Season" to the handmaiden presiding at the receipt of custom, whereupon she said: "I winna sairve ye," or words to that effect, quoting as her authority the clause in an Act which forbids the serving of intoxicants to already inebriated persons.

The R.M.A. arrow-fixers should be more careful.

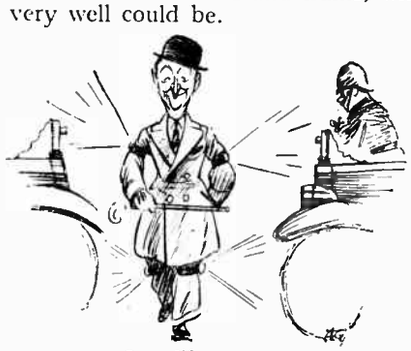
Self-preservation

THE recent Motor Show was interesting to radio enthusiasts if for no other reason than the presence of car radio. I was surprised, however, to note the absence of a major application of the principles of radio or at least of the thermionic valve and its cousin, the photo-electric cell. I had heard all about this new device in a neighbouring foreign country to which I repaired during the first week in October as a sort of meteorological antidote to Manchester.

The apparatus was mainly intended to prevent that type of motor accident caused when the driver of a car suddenly stands on his brakes while the man in the car behind is gossiping with his lady friend.

Each car is equipped with a photo-electric cell mounted in such a position that the tail light of a car close in front shines into it and causes it to do its stuff. Now the aforementioned stuff is done, of course, *via* the customary valve amplifier, and consists of shutting off the steam and jamming on the brakes, thus preventing what might otherwise be a regrettable incident. The driver can thus give all his attention to his fair companion without risk of bumping the man in front. If made compulsory by law it would, of course, make motoring much easier.

To my mind, however, its legal adoption would confer a greater boon on the pedestrian than anything else, as by strapping lights on to his legs at a suitable height he would literally become his own life-preserver, provided that the photocell device was fitted also on bikes and trams, which it very well could be.



Own life-preserver.

I have suggested this to the promoters of the device, who have accordingly invited me to be the leading pedestrian participator in the preliminary trials, which are to be held next week. *Au revoir.*

Amateurs and the Navy

A SCHEME whereby ships of the Home Fleet may undertake tests in collaboration with members of the Royal Naval Wireless Auxiliary Reserve is already being realised. H.M.S. "Pangbourne" is already taking part in certain exercises with No. 1 District (London).

The Reserve has now been in existence for one year, and the membership has now increased to 225, as compared with 110 in February last. Of these, 60 are members of the Radio Society of Great Britain, and 44 are transmitters. The training has been continued systematically both by verbal instruction and by wireless. Of all the districts, No. 1 (London) has the greatest advantage in that most of its members are able to attend at the Admiralty for instruction on Monday and Thursday evenings. The method of training in other districts has offered greater difficulties, but instruction is being carried out slowly but steadily by wireless.

The ultimate object of the Reserve is to provide those radio enthusiasts who are attracted by service in the Navy in the Telegraphist Branch the opportunity to utilise their special abilities in the service of their country.

Those interested should apply for particulars to the Office of the Admiral Commanding Reserves, Queen Anne's Chambers, Tothill Street, London, S.W.1.

The Wireless World

FOREIGN PROGRAMME SUPPLEMENT

SUNDAY

NOVEMBER THE FIFTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.0 p.m.,** Dance Music. **7.30,** Sound Film Music. **7.55,** News. **8.0,** Time. **8.2,** Concert by the Station Orchestra, conducted by Henry Defosse. In the interval at **8.30,** News and Gramophone Records. **9.30,** News. **9.35,** Dance Refrains. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,328 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.**—**1.0 to 2.0 p.m.,** Programme arranged by the International Broadcasting Company (Ireland), Ltd. (Items subject to alteration.) **1.0,** Concert of Dance Music: Dancing Butterfly; Shuffle off to Buffalo; Foxtrot Medley, Le million; Looking Forward; Morning, Noon and Night; We're all alone; Hustlin' and bustlin'; What have we got to lose? **1.30,** Concert of Dance Music: The River's takin' care of me; My Moonlight Madonna; I guess I'll have to change my plans; The Night is gone. **1.45,** Dance Music: Let's call it a Day; Don't blame me; I can't remember; Dixie Doorway. **8.30,** Time Signal. **8.31,** The Station Orchestra. **8.45,** The Serenaders' Vocal Quartet. **9.0,** Everyman—Morality Play produced by the Gate Theatre, with the Station Orchestra and a Vocal Quartet. **10.30,** The Station Orchestra. **10.45,** Pipe and Fiddle Music. **11.0,** Time, News, Weather, and Close Down.

BARCELONA

EAJ1, 850 kc/s, 349.6 metres; 8 kW.—**1.0 p.m.,** Gramophone Music. In the interval at **1.30,** Theatre Notes. **2.0,** Trio Concert. **3.0,** Programme for Hospitals and other Benevolent Institutions, with Gramophone Records. **4.0 to 5.0,** Interval. **5.0,** Agricultural Talk and Gramophone Records. **6.0,** Concert by the Radio Orchestra. **6.30,** Song Recital by Eusebi Carususán (Tenor). **7.0,** Concert by the Radio Orchestra; Soloist, Janette Bergman (Songs). **8.0,** Dance Music relayed from Hollywood Bar. **9.0,** Gramophone Music. **10.45,** Chess Lesson. **11.0** (approx.), Close Down.

BASLE.—See **Schweizerischer Landessender.**

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc s, 1,635 metres; 60 kW. —**5.15 a.m.,** Gymnastics. **5.30,** To-day's Motto. **5.35,** Harbour Concert from **Hamburg. 7.0,** Agricultural Programme. **7.55,** Chimes and Religious Programme. **9.5,** Weather. **10.0,** Helmut Wegener reads from his own Works. **10.15,** Weather. **10.30,** See **Leipzig. 11.0,** Orchestral Concert, conducted by Artur Rink: Overture, Au mein Vaterland (Ailbout); Selection from The Maid from the Black Forest (Jessel); Glow Worm Idyll (Lincke); Tatiana (Lindsay); Kirschblütenfest (Dicker); Paraphrase on the Song, Aus der Jugendzeit (Friedemann); Intermezzo, Seftra (Siede); Slav Rhapsody No. 2 (Friedemann); Harlander Marsch (Pschorr). **11.55,** Time Signal. **12 Noon,** Part Relay of a Concert from **Hamburg. 1.0 p.m.,** Hunting Stories. **1.30,** The Watchword. **1.35,** Programme for Young People. **2.0,** Songs for Children. **2.30,** Rural Programme—Music and Poems. **3.35,** Part Relay of a Concert from **Munich. 4.15,** Report of the International Football Match, Germany v. Norway. **5.0,** The Watchword. **5.5,** Concert by the Regensburg Cathedral Choir, conducted by Dr. Schrems. **6.0,** An Interview with Godfried Rooms, the Flemish Author. **6.10,** Interlude on Gramophone Records. **6.30,** A Family Council—Short Radio Play (Edith Eriksen). **6.50,** Sports Notes. **7.0,** Concert by the Cologne Chamber Orchestra, conducted by Hermann Abendroth. Soloist: Karl Schwamberger (Viola da Gamba). Concerto in A Minor for String Orchestra (Vivaldi); Concerto grosso in D Minor for String Orchestra (Handel); Suite in D for Viola da Gamba and String Orchestra (Caix d'Hervelois); Eine kleine Nachtmusik—Serenade for String Orchestra (Mozart). **8.0,** An Epoch in Dance Tunes—the Post-War Years. **9.0,** News. **9.45,** Weather. **10.0,** Programme from **Langenberg. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB, and DJE** (See Short-wave List).—**10.30 a.m.,** See **Leipzig. 11.0,** Concert, relayed from **Braslau. 1.0 p.m.,** Interval. **1.30,** The Morning Star of Wittenberg—a Portrait of Luther's Wife, Catherine von Bora (Lisa Schultze-Kunstmann). **2.15,** To-day's Watchword. **2.20 to 2.30,** Programme from **Munich. 2.50,** Talk: Curiosities of Berlin. **3.0,** Concert by the Berlin Kampfbund Orchestra, conducted by Erich Herzmann. **4.0,** Concert by the Magdeburg Male Voice Choir, conducted by Walter Rabl, relayed from **Magdeburg. 4.20,** Orchestral Concert (contd.). **5.0,** To-day's Watchword. **5.5,** Humorous Programme. **5.25,** Concert of Eighteenth Century Chamber Music. **6.30,** Radio Sequence. **6.50,** Sports Notes. **7.5,** Concert by the Berlin Station Orchestra, conducted by Clemens Schmalstich. **9.0,** Weather and News, followed by Dance Music on Gramophone Records. In an interval at **10.0,** Topical Talk. **12 Midnight** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Dyk. **4.30,** Russian Concert, relayed from **Kosice, 1,022 kc/s, 393 metres. 6.0,** See **Prague. 6.5,** Reading. **6.25,** See **Prague. 7.10,** Programme to be announced. **8.0,** See **Prague. 10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**10.30 a.m.,** See **Leipzig. 11.5,** Orchestral Concert, conducted by Max Käden. **1.0 p.m.,** News. **1.5,** Agricultural Notes. **1.20,** Talk: Thundery Weather and Long Distance Wireless Reception. **1.35,** Reading (Kleemann). **2.0,** Programme for Children. **2.30,** Talk: To-day's Watchword. **2.35,** Reading. **3.0,** Concert by the Silesian Philharmonic Orchestra, conducted by Rischka. **3.55,** Sonata (Schubert) for Pianoforte and 'Cello, by Otto Becker and Curt Becker. **4.30,** To-day's Watchword. **4.35,** Concert by the Silesian Philharmonic Orchestra, conducted by Rischka. **5.45,** Talk for Women. **6.5,** Radio Report on the Second Half of the International Football Match, Germany v. Norway, relayed from **Magdeburg. 6.35,** Weather. **6.40** (approx.), Reading (Schimmel-Falkenau). **7.0,** Request Concert by the Station Orchestra, conducted by Rischka. In an interval at **8.0,** Talk: Germany and the Treaty of Versailles. **9.30,** Time and News. **10.0,** See **Munich. 11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**2.0 p.m.,** Schwanda the Piper—Opera (Weinberger), relayed from the National Theatre. **4.30,** Radio Report. **4.45,** Gramophone Music. **5.0,** German Transmission: Village Band Concert. **6.0,** See **Prague. 6.5,** Accordion Solos. **6.25,** See **Prague. 7.10,** Popular Band Concert. **8.0,** See **Prague. 10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc s, 509.2 metres; 15 kW.—**11.0 a.m.,** Concert by the Small Station Orchestra. **12 Noon,** Concert by the Station Symphony Orchestra. **1.0 p.m.,** Le Journal Parlé. **1.10,** Orchestral Concert, conducted by André Felleman, relayed from the Grand Hotel, Antwerp. **5.0,** Dance Music, relayed from the St. Sauveur Palais de Danse. **5.30** (approx.), Football Results. **6.10,** Pianoforte Recital. **6.40,** Programme for Children. **7.0,** Gramophone Music. **7.15,** Religious Address. **7.30,** Le Journal Parlé. **8.30,** Concert by the Radio Orchestra. **8.45,** Reading of the Love Poems of Baudelaire, Verlaine, Francis Jammes and Paul Fort. **9.0,** Orchestral Concert (contd). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—**10.0 a.m.,** Concert by the Small Station Orchestra, conducted by Leemans. **11.0,** Gramophone Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Station Symphony Orchestra, conducted by Kumps. **5.0,** Concert by the Radio Orchestra, conducted by Charles Walpot. **5.30** (approx.), Sports Notes. **6.0,** Gramophone Music. **6.15,** Concert by the Small Station Orchestra, conducted by Leemans. **7.15,** Religious Address. **7.30,** Le Journal Parlé. **7.55,** Talk on Music. **8.0,** Concert by the Station Symphony Orchestra, conducted by Kumps. In the interval at **8.45,** Reading of Religious Poetry. **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**12.15 p.m.,** Light Music on Gramophone Records. **3.0,** Programme for Peasants. **4.0,** Light Music by the Jean Marco Orchestra. In the interval at **5.0,** Radio Journal. **6.0,** Educational Programme. **6.40,** Gramophone Music. **6.45,** Review of the Week. **7.0,** Recital of R. Strauss, Wolf and Reger Songs by Mme. Rosl Radulesco. **7.20,** Concert by the Station Orchestra. In the interval at **8.0,** Talk. **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **7.15 p.m.** till Close Down.—**8.15 a.m.,** News. **9.0,** Protestant Service. **10.0,** Catholic Service. **11.15,** Time and Weather. **11.20,** Concert by the Karl Bura Cigány Band. **1.0 p.m.,** Gramophone Music. **2.0,** Agricultural Talk. **3.30,** Talk. **4.40,** Variety Concert, relayed from the Academy of Music. **6.45,** Reading. **7.15,** Concert of Favourite Operetta Music. **8.15,** Sports Notes and Racing Results. **9.0,** News. **9.15,** Music by the Guttenberg Dance Band and the Lajos Veres Cigány Band, with Hungarian Folk Songs by Paul Kalmar, relayed from the Café Ostende.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY, 31.51 metres.**—**11.0,** Town Hall Chimes. **11.2,** Concert from the State Broadcasting Building—The Radio Orchestra, conducted by Launy Gröndahl. **12 Noon,** Talk in English: Student Life in Cambridge. **12.20 p.m.,** Talk in German. German Drama of the Pre-War Period. **12.40,** Talk in French: André Lichtenberger—the Child Psychologist. **1.0,** Accordion Recital. **1.25,** Gramophone Records of Popular Music. **1.55,** Programme for Children. **2.25,** First Act of Mignon—Opera (Thomas), from the State Broadcasting Building. **4.0,** Divine Service Relay. **5.20** (from the Odense Studio), Talk. **5.50,** Weather and News. **6.15,** Time Signal. **6.30,** Talk: Young People and Films. **7.0,** Town Hall Chimes. **7.2,** The Hansen Family—Humorous Episode (Jens Locher). **7.15,** Concert by the Station Orchestra, conducted by Launy Gröndahl. **7.45,** Pictures of Everyday Life—a Visit to a Ballet School. **8.15,** Concert (contd.). **8.40,** News. **8.50,** Concert (contd.). **9.15,** Italian 'Cello Music of the Eighteenth Century. **9.30,** Concert (contd.). **10.0,** Dance Music from the Wivex Restaurant. In the interval at **11.0,** Town Hall Chimes. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**6.0 p.m.,** News. **6.5,** Miscellaneous Items and Announcements. **6.15,** Talk: Student Life in Past Centuries. **6.30,** See **Warsaw. 6.45,** Programme Announcements. **8.15,** Humorous Programme, relayed from **Lwów, 788 kc/s, 381 metres. 9.15,** Sports Notes. **9.25,** See **Warsaw. 10.30** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m.** till **12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I, Orchestral Concert: Signature Tune; Waltz, The Blue Danube (Joh. Strauss); Pizzicato from Sylvia (Delibes); Song, Pretty One (Strauss); At the Convent Gate (Sherwood); Down in the Forest (Landon Ronald); Violin Solo, Moment musical (Schubert); Bells across the Meadow (Ketelbey); Humoresque (Dvorak). Part II, Organ Recital: Isn't it heavenly? (Hamburg); In a Chinese Temple Garden (Ketelbey); Londonderry Air (Traditional); There's Something about a Soldier (Gay); Spirit of America (Zamecnik); My Moonlight Madonna (Fibich); Serenade (Drigo); Ding, Dong, Ding (Hargreaves); Signature Tune. **12 Noon,** Programme in French. **2.0 to 7.30 p.m.,** Programme in English by the I.B.C. **2.0,** The Musterole Broadcast. Some Old Favourites, including: Put on your Old Grey Bonnet; I'm falling in Love with Someone; Smile for me; Selection from Love me To-night; Sweethearts for Ever; Cecilia; The Song of Songs; Canadian Capers; You'll get by; Selection from Sally. **2.30,** The Downham Estates Concert: Signature Tune; Let's all be Happy Together; Martial Moments (arr. Winter); Love is the Sweetest Thing; Xylophone Solo, Selection from Carmen (Bizet); Waltz, The Blue Danube (Joh. Strauss); Accordion Solo, The Skaters' Waltz (Waldteufel); Ständchen (Heykens); There's Something about a Soldier (Gay); Selection from Noel Coward's Cavalcade. **3.0,** Gramophone Concert: Washington Post March (Sousa); Putting it on (Boswell); Tango, Dawn in Montmartre (Demare); Organ Solo, Valse poudrée (Popy); The Doll's Song, from The Tales of Hoffmann (Offenbach); Pianoforte Solo, Dancing Butterfly (Petkere); Veterans of Variety; Grieg Potpourri (arr. Urbach). **3.30,** Orchestral Concert: Southern Rhapsody (Hosmer); Pianoforte Solo, The Birth of the

Blues (Henderson); Her First Dance (Heykens); Selection from Give me a Ring (Broones); Pianoforte Solo, My Heart stood still (Rodgers); She's Everybody's Sweetheart now (Hargreaves); Romance (Löhr); Love and Life in Vienna (Renard). **4.0,** Judge Rutherford's Address. **4.15,** The I.B.C. Nursery Corner: Birthday Greetings. **4.30,** The I.B.C. Nursery Corner (contd.). **5.0,** Broadcast of Dance Music: Signature Tune; Try a Little Tenderness; My Own (Little); A Girl like Nina (Abraham); Tony's Wife (Adamson); Selection from Dinner at Eight (Fields); Signature Tune; Try a Little Tenderness. **5.15,** Some Requests from Norwich Radio Friends: Waltz Song from La Bohème (Puccini); Selection from The Desert Song (Romberg); Intermezzo from Cavalleria rusticana (Mascagni); Selection from The Merry Widow (Lehár). **5.30,** Light Music: Who do you think you are? (Heymann); Play of Butterflies (Heykens); Solitario Tango (Burli); Rosa Mia (Guizar). **5.45,** Concert of Dance Music: It's the Talk of the Town; Oh! Johanna; Mary Rose; Sentimental Gentleman from Georgia. **6.0,** Bognor Regis Broadcast: Selection from The Song of Songs (Moya); War March of the Priests (Mendelssohn); The Skaters' Waltz (Waldteufel); Snowball (Carmichael); My Ain Folk (Mills); Dear, dear, from Bitter Sweet (Coward). **6.30,** Concert of Old Favourites: A Smoking Concert; At the Old Pig and Whistle (Butler); Widdecombe Fair; My Old Dutch (Chevalier); Love's Old Sweet Song (Molloy); When Father papered the Parlour; Lily of Laguna (Stuart); A Smoking Concert. **7.0,** Military Music: Jolly Fellows (Vollstedt); In a Clock Store (Orth); The Teddy Bears' Picnic (Bratton); Berceuse (Lacôme); The Hunt in the Black Forest (Voelker); Birthday Serenade (Lincke); Down South (Myddleton); Victoria March (Blon). **7.30,** Programme in French. **9.0** till Close Down, Programme in English by the I.B.C. **9.0,** Concert of Dance Music: Signature Tune, Happy Feet; I'll take an Option on you; Let's call it a Day; Forever; Egypt; 'Twixt the Devil and the Deep Blue Sea; Mademoiselle; Villa; It's not a Secret any more; Signature Tune, Happy Feet. **9.30,** Talkie Time. Tunes from the Talkies: Signature Tune, Sittin' in the Dark; Selection from This Week of Grace (Parr-Davies); A Glass of Golden Bubbles (Strauss); I've found the Right Girl (Lupino); Why has a Cow got Four Legs? (Ellis); But for you (Hollander); In the Park in Paree (Woods); Selection from College Humour (Coslow); Smilin' through (Penn); Signature Tune. **10.0,** Orchestral Concert: Rakoczy March (Berlioz); Song, Whither (Schubert); Dance of the Sylphs (Berlioz); The Witches' Ride (Puccini); Violin Solo: Air on the G String (Bach); Concert Waltz in D (Glazunov); O Star of Eve (Wagner); Mozart Potpourri (arr. Urbach). **10.30,** Concert of Dance Music: In the Valley of the Moon; Down the old Ox Road; Moonstruck; Let the World go drifting by; There's a Cabin in the Pines; Dancing Butterfly; Moths around the Candle Flame; If you'll say "Yes," Chérie; Hold me. **11.0,** Broadcast of Dance Music: Forty-second Street (Warren); Morning, Noon and Night; Oh! Johanna (Lawrence); Snowball (Carmichael); Cecilia Mia (Frontela); Louisville Lady (Hill); Selection from Dinner at Eight (Fields); Solitario (Burli); Goodnight, Little Girl of my Dreams (Tobias); Signature Tune, Happy Days are here again. **11.30,** Concert by the I.B.C. (Ireland), Ltd.: Signature Tune, Come Back to Erin; Pride of the Wolferinés (Sousa); Selection from The Chocolate Soldier (O. Straus); Song, Fairy Tales of Ireland (Coates); I kiss your Lips (Rudolphe); The Valley of the Poppies (Ancliffe); The Lass from County Mayo (Browne); Egyptian Serenade, Amina (Lincke); Selection from The Flower of Hawaii (Abraham); Signature Tune, Come back to Erin. **12.5 a.m. (Monday),** The I.B.C. Late News Bulletin in English. **12.10** (approx.), Club Concert for Ayr and Prestwick Listeners: Part I, Vocal Concert: Signature Tune, The Chum Song; Orchestra: Meg Merrilies (arr. Diack); Duncan Gray (Traditional); Song, Bonnie Wee Thing (Fox); Orchestra: The Foula Reel (Traditional); Ye Banks and Braes (Traditional). Part II, Dance Music: Experiment; Shadows on the Swannee; How could we be wrong; The Last Round Up; The Wedding of Mickey Mouse; Lay your Head on my Shoulder; Adios Goodbye; Don't blame me. **1.0,** Dance Music: Signature Tune, The Bells of Normandy; Look what you've done; Isn't this a Night for Love?; What a Perfect Combination; I bring a Song; With you here and me here; You're an Old Smoothie; Hold your Man; Sing Another Line; Ding, Dong, Ding; Trouble in Paradise; Blue Cloud; Lover's Lane; I'll show you off; I've got to pass your House; Sundown in a Little Green Hollow; Avalon; Signature Tune. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres. —10.30 a.m.,** See **Leipzig. 11.0,** Programme to be announced. **11.20,** Orchestral Concert, conducted by Wilde: Florentine March (Fucik); Waltz, Wiener G'muath (Schrammel); Ihr erster Tanz (Heykens); Slav Rhapsody No. 2 (Friedemann); Two Polkas: (a) Feuerfest (Jos. Strauss), (b) Tik-Tak (Joh. Strauss); March, Strassenlümmel (Bernards). **12.15 p.m.,** Gramophone Concert. **1.5,** Programme arranged by the Wiesbaden Board of Agriculture. **1.15,** Rural Programme. **1.35,** See **Langenberg. 2.30,** Programme to be announced. **3.0,** See **Langenberg. 4.15,** See **Berlin (Deutschlandsender). 5.0,** Radio Report: The Kalkheim Furniture Industry. **5.30,** Variety Programme. **6.0,** Sports Notes. **6.10,** Talk by a Former Chief of the Intelligence Department. **6.30,** Talk: Village Libraries. **7.0 to 9.0,** See **Stuttgart. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News. **9.40 to 11.0,** See **Langenberg. 11.0,** Concert of Light Music on Gramophone Records. **1.0 a.m. (Monday),** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—10.30 a.m.,** See **Leipzig. 11.0,** Concert by the Small Station Orchestra, conducted by Gerhard Maasz. In the interval at **11.55,** Time and Weather. **1.0 p.m.,** Programme for Children. **2.0,** Concert of Modern Italian Chamber Music by the Hamburg Wind Instrument Quintet. **2.50,** See **Berlin (Funkstunde). 3.15,** Wind Instrument Concert. **4.45,** Reading from the Works of Karl Maertin. **5.5,** Programme in North German Dialect. **6.5,** Timm-Kröger Programme. **6.35,** Sports Notes and Weather. **7.0,** Concert of Waltz and Operetta Music. In the interval, News. **9.0,** News. **9.20,** Review of the Week. **9.35,** Programme from **Berlin (Funkstunde). 12 Midnight,** Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig. 671 kc/s, 447.1 metres.—10.30 a.m.** (from **Danzig**), Recital of Songs by Heinz Marten (Tenor). **11.0,** Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner. Overture, Ariadne (Brambach); Musik am Abend (Graener); Selection from Don Carlos (Verdi); Russian Rhapsody (Börschel); Waltz, Künstlerleben (Joh. Strauss); Ballet Suite (Popy); Triumphal March from Aïda (Verdi). **1.0 p.m.,** Programme to be announced. **2.0,** A Radio Sequence. **2.15,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. **4.15,** See **Berlin (Deutschlandsender). 5.0,** Talk. **5.20,** Chamber Music for Wind Instruments. **5.55,** Talk. **6.0,** Concert of Music by East Prussian Composers. Soloists: Charlotte Bonsa-Pirassby (Soprano), Kurt Dombrowsky (Violin) and Karl Ninke (Pianoforte). Andante from the Sonata in E Minor Op. 52 for Violin and Pianoforte (Max Laurischkus); Songs (Noetel): (a) Klange, (b) Kleines Bild, (c) Nacht, (d) Ernste Stunde; Songs (Friedrich Welter: (a) Sie gedenkt des fernen Gatten, (b) Der Neugierige, (c) Drei Laub auf einer Linde (d) Elegie bei der Betrachtung eines Kindes, (e) Kinderlied; Capriccio Concertante (Laurischkus) for Violin and Pianoforte. **6.45,** Sports Notes. **7.0,** Bunter Abend. **9.0,** News. **9.15** (approx.), Dance Music from **Berlin (Funkstunde). 11.0** (approx.), Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to **5.40 p.m.,** and 20 kW from **5.40 p.m.—8.40** to **11.40 a.m.,** Programme of the Workers' Radio Society (V.A.R.A.). **8.40,** Pigeon Flying and Football Notes. **8.43,** Horticultural Talk. **9.10,** Orchestral Concert, conducted by de Groot. **10.0,** Recitation. **10.20,** Concert (contd.). Soloists: Gertrud Wertheim (Cymbal), Wiggellaar (Violin), and Sjouwerman (Flute). **11.10,** Address. **11.40 to 4.40 p.m.,** Programme of the General Broadcasting Society (A.V.R.O.). **11.40,** Time Signal. **11.41,** Concert by Paul Godwin and his Quintet. **12.55 p.m.,** Gramophone Records. **1.40,** Weekly Book Talk. **2.10,** Concert relayed from the Concertgebouw, Amsterdam. The Concertgebouw Orchestra conducted by Clements Krauss. Soloist: Nathan Milstein (Violin). Prelude to The Mastersingers (Wagner); Violin Concerto (Tchaikovsky); Ballet Music from Schlagöbers (R. Strauss). **3.40,** Talk: Bernard Shaw's Cæsar and Cleopatra. **4.0,** Gramophone Records and Sports Notes. **4.40,** V.A.R.A. Programme for Children. **5.40 to 7.40,** Programme of the Liberal Protestant Radio Society (V.P.R.O.). **5.40,** Talk. **6.25,** Divine Service, relayed from a Church in Beverwyk. **7.40** till Close Down, A.V.R.O. Programme. **7.40,** Time Signal. **7.41,** News. **7.55,** Concert of Musical Comedy Music. The Station Orchestra, conducted by Nico Treep. Soloists: Grethe Weijnschenk-Hogenbirk (Soprano), Lia Fuldaner (Soprano), Henk Viskil (Tenor), and Willem Schansman (Tenor). **9.10,** Recitation. **9.30,** Concert by the Station Orchestra, conducted by Nico Treep. **10.40,** Gramophone Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Trans-mitted from **Kootwijk** on 50 kW from **3.40 p.m.—8.10 a.m.,** Religious Programme of the Catholic Radio Society (K.R.O.). **9.10,** Programme of the Christian Radio Society (N.C.R.V.). **9.10,** Sacred Music. **10.0,** Divine Service from a Lutheran Church in Amsterdam. **11.55 to 4.40 p.m.,** K.R.O. Programme. **11.55 a.m.,** Concert by the K.R.O. Orchestra. **12.40 p.m.,** Talk. **1.0,** Concert (contd.). **1.50,** Book Review. **2.10,** Concert by the K.R.O. Boys, conducted by Lustenhouwer. **2.40,** Concert by the K.R.O. Boys, conducted by Lustenhouwer. **3.40,** Programme for Invalids. **4.40 to 7.25,** N.C.R.V. Programme. **4.40,** Organ Recital by Verkerke. **5.10,** Divine Service Relay. **6.40,** Divine Service. **7.25** till Close Down, K.R.O. Programme. **7.25,** Sports Notes. **7.30,** Talk. **7.50,** Gramophone Music. **7.55,** Concert by the K.R.O. Orchestra. In the intervals at **8.40,** News and Gramophone Music, and at **9.55,** News. **10.20,** Epilogue. **10.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Sports Notes and Amusement Guide. **8.15,** Radio Concert. In an interval at **8.45,** News. **10.0,** Request Half-Hour. **10.30 till Close Down,** Programme in English by the I.B.C. **10.30,** Variety Concert: Melodious Memories (arr. Finck); Sketch: John Henry's Night Out (Henry); Xylophone Solo: The Skater's Waltz (Waldteufel); Song: If you were the only Girl in the World (Ayer:) Piano Accordion Band: Coal Black Mammy (St. Helier); Song: I give my Heart, from The Dubarry (Millöcker-Mackeben); Tales from the Vienna Woods (Joh. Strauss). **11.0,** Light Orchestral Concert: Selection from The Maid of the Mountains (Fraser-Simson); Wedding Dance Waltz (Lincke); Uncle Pete (Jones); Play, Fiddle, Play (Lawrence); The Druid's Prayer (Joyce); Savoy Irish Medley (arr. Somers); Jollity on the Mountains (Fétras). **11.30,** Military Band Concert: March Medley (Charlie); A Merry Hunting Day (Partridge); Danse des Echarpes and Scène d'amour from La Source (Delibes); Carry on (Dundas); El Abanico (Javaloyes); Parade of the Tin Soldiers (Jessel); March, Old Comrades (Teike). **12.0 Midnight,** Dance Music: Moon Song; Waltzing in a Dream; Drifting down the Shalimar; I can't write the Words; I can't remember; Love is the Sweetest Thing; Harlem Fuss; Let's all dance the Polka; In the Valley of the Moon; I'll see you in the Morning; Maybe I love you too much; The Lady I love; The Old Spinning Wheel; Hold me; It's within your Power; Let's put out the Lights. **1.0 a.m.** (Monday), I.B.C. Goodnight Melody and Close Down.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**10.30 a.m.,** See **Leipzig. 11.0,** See **Frankfurt. 12.15 p.m.,** Gramophone Records of Anecdotes and Jokes. In the interval at **1.0,** Talk: The Watchword. **1.35,** Programme for Children. **2.30,** Trio No. 5 in G for Violin 'Cello and Pianoforte (Haydn). **2.40,** Talk for Parents and Children. **3.0,** Concert by the Chamber Quintet. **4.0,** Talk: The Watchword. **4.5,** Concert by the Station Orchestra, conducted by Buschkötter and the Station Chamber Choir, conducted by Breuer. **5.0,** A Flying Visit. **5.15,** Light Music: Serenade (Widor); Scottish Songs for Soprano, Pianoforte, Violin and 'Cello (Beethoven). **5.35,** Reading: Der junge Luther (Will Vesper). **6.0,** Humorous Programme with Musical Interludes. **6.45,** Sports Notes. **7.0,** See **Stuttgart. 9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News, Weather and Sports Notes. **9.40,** Serenade and Dance Music. **11.0,** See **Frankfurt. 1.0 a.m. (Monday),** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—10.30 a.m.,** Man singet mit Freuden vom Sieg—Cantata (Bach), by the Municipal and Gewandhaus Orchestra, the Choir of St. Thomas', and Soloists. **11.5,** Concert Relay. **1.0 p.m.,** Weather and Time. **1.5,** Programme Announcements. **1.25,** Agricultural Notes. **1.35,** Children and Animals before the Microphone. **2.10,** Radio Sequence. **2.30,** The Watchword. . . . **2.35,** Chamber Music. **3.10,** Wind Instrument Concert, from **Erfurt. 4.15,** See **Berlin (Deutschlandsender). 5.0,** Reading: Der Heiligenmaler (Alf Teichs). **5.20,** Popular Melodies of Yesterday, To-day, and To-morrow, on Gramophone Records. In the interval from **5.40 to 5.45,** The Watchword. **6.30,** Reading (Victor von Scheffel). **7.0,** Concert of Operetta Music by the Station Orchestra, conducted by Hilmar Weber. **9.0,** News. **9.15** (approx.), Programme to be announced. **10.0,** Dance Music Relay. **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—**12 Noon,** Concert by the Station Orchestra. **1.0,** Gramophone Music. **7.0** till Close Down. English Programme. **7.0,** Symphony Music on Gramophone Records. **7.50,** Violin Concerto in D, Op. 35 (Tchaikovsky). **8.25,** Talk by Father Pierre Lhande on his Travels in Southern India. **8.35,** Concert by the Station Orchestra, conducted by Pensis. In an interval at **8.50,** News in French. **9.35,** Selection from The Maid of the Mountains (Fraser-Simson), on Gramophone Records. **9.45,** News in German. **9.55,** Gramophone Music. **10.20,** Dance Music.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**12 Midnight** till Close Down, Programme in English by the I.B.C. Concert by the International Broadcasting Company (Ireland), Ltd. Signature Tune: Come back to Erin; Smile, darn yer, Smile (Rich); Selection from The Land of Smiles (Lehár); The Blue Danube (Joh. Strauss); Tiptoe through the Tulips (Dubin); Blues I love to sing (Ellington); Mama Inex (Grenet); Flower of Hawaii (Abraham); Beautiful Nice (Latorre); Signature Tune: Come back to Erin. **12.30 a.m. (Monday),** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**11.30 a.m.,** Municipal Band Concert, relayed from the Retiro. **2.0 p.m.,** Chimes, Time, Theatre Notes and Popular Music. **4.0 to 7.0,** Interval. **7.0,** Chimes, Announcements, and Dance Music, relayed from the Ritz Hotel. **8.30 to 9.30,** Interval. **9.30,** Chimes and Time. **9.35** (approx.), Variety Programme. **12 Midnight,** Chimes. **1.0 a.m. (Monday)** till Close Down, Programme in English by the I.B.C. Dance Music; 'Twixt the Devil and the Deep Blue Sea; Sweet Dreams Pretty Lady; With you here and me here; El Albanico; Sundown in a Little Green Hollow; Light of Foot; It's Sunday down in Caroline; 'Tis the Day; Si petite; For ever and for ever; From me to you; Remember my Forgotten Man; Reflections in the Water; I'm playing with Fire; It's Winter again; Pettin' in the Park. **2.0,** I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**6.25 p.m.,** See **Prague. 7.10,** Concert by the Station Orchestra, conducted by Plichta: Polonaise (Dvorák); Selection from The Tales of Hoffmann (Offenbach); Humoresque (Simicek); Waltz (Sebestik); In the Harbour of Port Said (Armandola); Polka (Tichy); Jubilee March (Fuchs). **8.0,** See **Prague.** 10.0 (approx.), Close Down.

MOSCOW

TRADES UNION; 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.—9.45 a.m.,** Talk in Swedish: Memories of an Old Bolshevist. **10.45,** Weather. **1.0 p.m.,** Programme in English. **1.45,** Weather. **2.0,** Educational Programme. **3.0,** German Lesson. **4.30,** Concert by Amateur Artists. **5.30,** Sextet Concert of Russian Music, with Songs and Gramophone Records. **8.0,** News. **8.30,** Programme Announcements and Wireless Notes. **8.55,** Chimes from the Red Square. **9.5,** Press Review. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres** and **Nürnberg, 1,256 kc/s, 239 metres. —10.30 a.m.,** See **Leipzig. 11.0,** Concert from the Feldherrnhalle. **12 Noon,** Time, Weather and Programme Announcements. **12.10 p.m.,** Agricultural Talk. **12.30,** Music for Everybody—Gramophone Concert. **1.30,** Chess Lesson. **2.0,** The Watchword. **2.10,** Concert by the Baier Instrumental Double Quartet. **2.30,** Die Bremer Stadtmusikanten—Fairy Play for Children. **3.0,** A Description of the St. Leonard Pilgrimage from the Pilgrimage Church at Tolz. **3.20,** Concert conducted by Erich Kloss. **4.15,** See **Berlin (Deutschlandsender). 5.0,** The Watchword. **5.10,** Organ Recital. **5.40,** A Radio Sequence. **6.0,** Instrumental Concert. **6.35,** A Peasant Wedding—Radio Picture (Max Peinkofer). **7.15,** Weather and Sports Notes. **7.30,** Concert of Light Music by the Station Orchestra, conducted by Karl List. **9.0,** Time and News.

NOV. 5th SUNDAY *continued*

9.15 (approx.), Programme to be announced. 10.0, Serenade by the Station Schrammel Ensemble. 11.0 (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres, Rjukan, 671 kc/s, 447.1 metres,** and **Jelöy, LCL.**—9.15 a.m., Weather and News. 9.20, Chimes. 9.30, Divine Service, relayed from St. Saviour's Church. 4.0 p.m., Concert by the Station Orchestra. 5.0, Reading. 5.25, Talk. 5.45, Quartet in F minor, Op. 1 (Udbye), relayed from **Trondheim, 605 kc/s, 495.8 metres.** 6.15, Weather and News. 6.30, Soloist Programme. 6.40, Talk on the Play Lindelin (Jonas Lie). 7.0, Time Signal. 7.1, Lindelin—Play in One Act (Jonas Lie). 8.0, A Journey with the Microphone through East Oslo. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Concert by the Vienna Schrammel Quartet, relayed from **Bergen, 824 kc/s, 364 metres.** 9.45, Dance Music on Gramophone Records. 11.0 (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**12.30 p.m.,** Concert by the Jean Ibos Orchestra. In the interval at 1.0, News and Press Review. 5.45, Le Journal Parlé. 7.30, Gramophone Concert. 9.0 (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**10.30 a.m.,** Sponsored Gramophone Concert. 11.0, Orchestral Concert. **12.15 p.m.,** Sponsored Concert of Music from Sound Films. 12.45, Sponsored Programme. 12.50, Half-an-Hour of Fantasy by Paul Weil. 1.30, Sponsored Gramophone Concert. 2.0, Interval. 7.0, Le Journal Parlé. 7.5, Sports Notes. 7.15, Extracts from Samson and Delilah—Opera (Saint-Saëns), on Gramophone Records. 7.30, Catholic Review. 8.0, Gramophone Concert of Light Music. 8.30, Il faut qu'une porte soit ouverte ou fermée—Play (de Musset). 9.15, Concert. 10.30, News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**7.45 a.m.,** Gramophone Music. 8.0, Press Review and Weather. 8.30, Physical Culture. 9.20, Advanced English Lesson. 9.40, Elementary English Lesson. 10.0, Elementary Book-keeping Lesson. 10.20, Advanced Book-keeping Lesson. 10.40, Spanish Lesson. **12.0 Noon,** Religious Address. **12.20 p.m.,** Sacred Music: Toccata in A flat (de la Tombelle); Exultate Deo; Dialogue (Clérambault). 12.30, Gramophone Concert: Overture, Gwendoline (Chabrier); Traum durch die Dämmerung (R. Strauss); Selection from Il Guarany (Gomez); Hindu Song (Rimsky-Korsakov); Kikimora (Liadov); Piece in D (Busser); Selection from Scaramouche (Messager); Selection from An American in Paris (Gershwin); O primavera (Tirindelli); Suite carnavalesque (Thomé); Auprès de ma blonde (arr. Chomel); Arabesque No. 1 (Debussy); Manola (Liberad); Waltz, Très jolie (Waldteufel); The Cockchafers' Tea Party (Noack); Nogent sur Marne (Paradis). In the interval at **12.45,** Press Review, News and Weather. 1.30, Gramophone Music. **2.0 to 2.30,** Programme arranged by the International Broadcasting Company of London: Concert of Dance Music: Signature Tune: Happy Feet; From me to you; Headin' for a Weddin'; True and Sincere Love; Roll up the Carpet; Mary Rose; Dinner at Eight; Sentimental Gentleman from Georgia; Sweet Dreams, Pretty Lady; Signature Tune: Happy Feet. **3.0 to 3.30,** Programme arranged by the International Broadcasting Company: Orchestral Concert: March, Over There (Cohen); Selection from Cochran Shows; Waltz, Eileen Alannah (Bonheur); Selection from Ball at the Savoy (Abraham); Vilia Intermezzo from The Merry Widow (Lehár). 3.30, Concert. 4.15, Variety Concert. 7.0, Concert of Light Music. 8.0, Radio Paris Circus. 8.30, News, Sports Notes and Weather. 8.45, Gramophone Music. 9.0, Bloch de Chicago—Comedy in Four Acts (Tristan Bernard) relayed from the Madeleine Theatre. In the interval, News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**8.30 p.m.,** Anatobal's Cubans, from **New York.** 9.0, True Railroad Stories. 9.15, Morin Sisters, from **New York.** 9.30, Vesper Services. 10.30, Grand Hotel, from **New York.** 11.0, Pathé News. 11.15, Weather and Sports. 11.30, Happy Felton's Orchestra. **11.45 to 2.45 a.m. (Monday), New York** Relay. 11.45, True Engineering Stories. **12 Midnight,** Vincent Lopez Orchestra. 12.30, Joe Penner. 1.0, Light Opera Nights. 2.0, Gulf Headliners. 2.30, Walter Winchell. 2.45, Marvellous Melodies. 3.0, Novelty Orchestra, from **New York.**

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**10.0 a.m.,** Pan—Symphonic Poem, Op. 43 (Novák), by the Station Orchestra, conducted by Jeremiss. 11.0, Chimes. 11.5, News. 11.15, Extracts from Frühlingsstürme—Operetta (Weinberger), relayed from the Opera House. **12.30 p.m.,** Agricultural Programme. **1.15 to 1.25,** Social Report. 3.0, See **Bratislava.** 4.30, Talk: In an Aeroplane over the Tatra Mountains. 4.45, Gramophone Music. 5.0, German Transmission: Music Review. 8.20 (approx.), Der Rose Pilgerfahrt—Oratorio (Schumann). After the Programme, News. 6.0, News. 6.5, Tchaikovsky Song Recital by Lavrova-Demkova for the Fortieth Anniversary of the Composer's Death. 6.25, Talk on the following Transmission. 6.40, A Hunting we will go—Literary and Musical Programme. 7.10, See **Brno.** 8.0, Variety Concert. 9.0, Time and News. 9.20, Dance Music. 10.0 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**8.55 a.m.** (from **Lausanne**), Chimes. 9.0 (from **Lausanne**), Protestant Service, relayed from the St. Laurent Church. 10.0 (from **Lausanne**), Gramophone Concert. 11.30, News and Weather. 11.40 (from **Lausanne**), Gramophone Concert. **1.0 to 2.0 p.m.,** Interval. 2.0 (from **Lausanne**), Concert by the Small Station Orchestra. 3.0, Concert by the B.B.C. Wireless Military Band, relayed from **London. 4.0 to 5.0,** Interval. 5.0 (from **Lausanne**), Recital of Old French Songs by Odette Jeanmonod. 5.30 (from **Lausanne**), Pianoforte Recital by Anne-Marie Jaccard: Presto from the Italian Concerto (Bach); Tic-toc choc (Couperin); Ecossaise (Beethoven); Leggierezza (Liszt); Gnomenreigen (Liszt); Fileuses près de Carantec (Baton); Jardins sous la pluie (Debussy); Impromptu (Fauré). 6.0 (from **Lausanne**), Catholic Address. 6.30 (from **Lausanne**), Sports Notes. 7.0 (from **Lausanne**), Quintet Concert: Quartet in D for Flute, Violin, Viola and 'Cello (Mozart); Variations and Finale, Op. 51, for Flute, Violin, Viola, 'Cello and Harp (Pierné); Concerts royaux for Violin, 'Cello and Harp (Couperin); Suite for Flute, Viola, 'Cello and Harp (d'Indy). 8.0, Concert by the Radio-Suisse Orchestra, conducted by Echenard. 9.0, News and Weather. 9.10 (approx.), Report of the International Horse Racing at Geneva, followed by a Report of the Final of the Ski-ing Competition. 10.45 (approx.), Close Down.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**4.0 p.m.,** Orchestral Concert of Swedish and Norwegian Music, conducted by Parups. 5.0, Agricultural Talk. **5.30 to 7.0,** Bernhards Valle Programme, with Introductory Talk. The Station Orchestra, conducted by Medins, with Songs by Talis Matisa and Irma Kalnins. In an interval at 6.0, Weather Report. 7.0, News. 7.20, Songs and Duets. 7.35, Orchestral Concert, conducted by Medins: Overture, The Thieving Magpie (Rossini); Selection from The Pearl Fishers (Bizet); Potpourri (Schmalstich). 8.0, Weather and News. 8.35, Dance Music on Gramophone Records. 9.0, Dance Music by the Vlaseks Orchestra. 10.0 (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.,** and **2RO, 25.4 metres.**—**10.0 to 11.0,** See **Turin. 11.30,** Gramophone Music. **11.45 to 1.30 p.m.** (approx.), See **Turin.** In the interval at 1.0, Time and Announcements. 3.0 **(Naples),** Programme for Children. Weather and Sports Notes. 3.15, Gramophone Music and Sports Notes. 4.0, Concert of Chamber Music by Maria Flori (Violin), Saturno Meletti (Baritone), Maria Elena Cattani (Soprano), and Noceti (Guitar). In the interval at 5.0, Sports Notes. 5.30, Weather. 5.35 (approx.) to 6.30, Interval. 6.30, Sports Notes, Dopolavoro Report and News. 7.0, Time and Announcements. 7.30, Sports Notes. 7.45, Chamber Music Concert by Ugo Ajello ('Cello) and Emillo Livi (Tenor). 8.45 (approx.), Mattutino—Comedy in One Act (Fausto Maria Martini and Giulio Viola). 9.15 (approx.), Variety and Operetta Music. Conductor: Bonavolonta. 10.0, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHWEIZERISCHER LANDESSENDER

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Berne, 1,220 kc/s, 245.9 metres.—9.0 a.m. (from **Basle**), Protestant Service. 9.45 (from **Basle**). Ernst Markees Birthday Programme. 10.30 (from **Basle**), Readings. 11.0 (from **Basle**), Swiss Music on Gramophone Records. 11.30, Time Weather and News. 11.40 (from **Zürich**), Concert by the Radio Orchestra, conducted by Neppach. 12.30 p.m. (from **Basle**), Agricultural Programme. 1.0 (from **Basle**). Music by a Village Orchestra. 1.30 to 3.0, Interval. 3.0, Military Band Concert, relayed from **London.** 4.0 (from **Basle**), Reading. 4.30, Dance Refrains by a Girls' Choir. 5.0 (from **Basle**). Old and New Dance Music on Gramophone Records. 5.30 (from **Basle**), Talk in Italian; Humorous Stories and Anecdotes. 6.0 (from **Basle**). Time, Weather and Sports Results. 6.5 (from **Basle**), Wind Instrument Music on Gramophone Records. 6.15 (from **Basle**), Talk. 6.45 (from **Basle**), Concert by the University Orchestra, conducted by Ernst Markees. Soloist: Willy Rehberg (Pianoforte). 8.0, News. 8.10 (from **Basle**), Variety Programme with Fritz Worm. 9.15 (from **Basle**), Sports Notes and Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—8.0 a.m., Rural Programme. 8.30, Gramophone Music. 9.10, Esperanto Talk. 9.30, Talk for Workers, relayed from **Malmö, 1,301 kc/s, 230.6 metres.** 10.0, Divine Service. 11.45, Weather. 12 **Noon,** Talk. 12.20 p.m., Report on the Changing of the Guard and Military Band Music, relayed from the Royal Palace. Selection from Lohengrin (Wagner); In a Monastery Garden (Ketelbey); March (Korsgren). 1.0, Memorial Service with Choral and Instrumental Music, relayed from the Crematorium. 2.0, Gramophone Music. 3.0, Elementary English Lesson. 3.30, Programme for Children. 4.5, 'Cello Recital by Carl Christiansen. Sonata in G (Marcello); Sicilienne (Bach); Gavotte (Körling); Suite for 'Cello (Falla); Allegro appassionato (Saint-Saëns). 4.30, Reading. 5.0, Divine Service. 6.15, Weather and News. 6.35, Reading. 6.45, The Geisha—Operetta in Two Acts (Sidney Jones). 8.45, Weather and News. 9.0, Concert by the Radio Orchestra, conducted by Nils Grevillius. Soloist: Nora Duesberg-Baranovski (Violin); Violin Concerto in D (Tchaikovsky); Three English Pieces (Cyril Scott); Irish Rhapsody (Stanford). 10.0, (approx), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—9.30 a.m., Orchestral Concert, conducted by Maurice de Villers. 10.45, Protestant Service. 11.30, Catholic Service. 12 **Noon,** Gramophone Concert of Popular Music. 12.45 p.m., News. 1.0, Time Signal. 1.1, Gramophone Concert of Light Music. 2.0, Agricultural Talk in German. 2.15, Variety Music on Gramophone Records. 3.0, Interval. 3.30, Dance Music on Gramophone Records. 4.30, Symphony Concert by the Pasdeloup Concert Society, relayed from the Théâtre des Champs-Elysées, Paris. 6.30, Medical Talk in German. 6.45, Sports Notes. 7.0, Light Music on Gramophone Records. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Ciel de gloire—Radio Play in Three Acts (Henry Dorians). In an interval at 9.30 (approx.), Press Review. 10.30, Dance Music, relayed from the Savoy. 12 **Midnight** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—10.30 a.m., See **Leipzig.** 11.0, See **Frankfurt.** 12.15 p.m., Opera Music on Gramophone Records. 1.15, Agricultural Talk. 1.35, See **Langenberg.** 2.30 Gramophone Records. 3.0, See **Langenberg.** 4.15, See **Berlin (Deutschlandsender).** 5.0, Gramophone Concert. 6.40, Sports Notes. 7.0, Bach Aria Recital: Lore Fischer, with Harpsichord and Flute accompaniment: Recitative and Aria from the Cantata Kreuz und Krone; Aria from the Cantata—No. 169—Gott soll allein mein Herze haben; Aria from Cantata No. 79—Gott ist unser Sonn' und Schild. 7.25, Pictures of the Luther Era—with illustrations from Hans Johst, Will Vesper, Wilhelm Kottenrodt and Gustav Freytag. 8.20, Concert by the Station Orchestra, conducted by Ferdinand Drost: Overture, The Flying Dutchman (Wagner); Overture, The Barber of Bagdad (Cornelius); Symphonic Poem, Les Préludes (Liszt). 9.0, See **Frankfurt.** 9.20, Topical Talk. 9.30, News and Sports Notes. 9.40 See **Langenberg.** 11.0, See **Frankfurt.** 1.0 a.m. **(Monday),** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc s, 385 metres; 8 kW.—12 **Noon,** Military Music. 12.15 p.m., Arias from Opera. 12.30, Catholic Service. 12.45, Orchestral Music. 1.0, Amusement Guide, Market Prices, and Time. 1.5, Light Music. 1.15, Operetta Airs. 1.30, Russian Songs with Balalaika Accompaniment. 1.45, Protestant Service. 2.0, Sound Film Music. 2.15, Agricultural Report. 2.30, Music by a Symphony Orchestra. 3.0, Concert. 3.30, Accordion Music. 3.45, Light Music by a Viennese Orchestra. 4.15, Arias from Opera. 4.45, Orchestral Music. 5.0, Thé dansant. 5.45, Music by an Argentine Band. 6.0, News. 6.15, Chansonnettes. 6.30, Military Music. 6.45, Selection from Operettas. 7.0, Orchestral Music. 7.15, News and Racing Results. 7.30, Extracts from Opera. 8.0, Light Music. 8.30, Extracts from Sound Films. 8.45, Orchestral Music. 9.0, Concert Version of Carmen—Opera (Bizet). 9.30, Concert by a Symphony Orchestra. 10.0, Aviation Report. 10.15, News Bulletin. 10.30, Concert for Listeners in Morocco. 11.0, Dance Music. 11.30, Vocal Tangos. 11.45, Opera Music. 12 **Midnight,** News. 12.5 a.m. **(Monday),** Chansonnettes. 12.15, Light Music. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—8.40 a.m., Programme from **Turin.** 8.55, Mass from the Cathedral of San Giusto. 9.35, Agricultural Report. 10.0, Religious Address. 10.20, Agricultural Talk. 11.0 till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc s, 322.2 metres; Genoa, 959 kc s, 312.8 metres,** and **Florence, 598 kc s, 501.6 metres.**—10.0, Mass from the Church of the Annunciation, Florence. 11.0, Religious Address. 11.30, Gramophone Music. 11.45, Sponsored Music. 12 **Noon,** Time and Announcements. 12.5 p.m. to 1.30, Variety Concert. 3.0, Orchestral Concert. In the interval, Sports Notes. 4.0, Variety Concert. In the intervals, Football Results. 5.0, Sports Notes. 5.15, Weather. 6.0, Time, Football Results, Dopolavoro Notes and Gramophone Music. 6.15, Gramophone Music. 7.0, Announcements and Gramophone Music. 8.0, "La Belle Hélène"—Opera-Comique (Offenbach), relayed from the Argentina Theatre, Rome. In the interval, Talk and Theatre Notes. After the Opera, Giornale Radio.

VIENNA

580 kc s, 517 metres; 100 kW. Relayed by **Graz, 852 kc s, 352.1 metres; Innsbruck, 1,058 kc s, 283 metres; Klagenfurt, 662 kc s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—8.35 a.m., Unveiling of the Memorial for the Prisoners of War Fallen, relayed from the Russian Church. 9.35, Violin Sonatas. 10.0, Religious Address. 10.40, Recitation. 11.0, Concert by the Wiener Symphoniker, conducted by Anton Konrath. Soloist: Joachim Stutschewsky ('Cello). 1.0 p.m., Report on Gramophone Records of the Twenty-fifth Anniversary Celebrations of the Austro-German Trade Treaty. 1.45, Time, Programme Announcements and News. 2.0, Talk: The Winter Life of the Bees. 2.20, Review of Books. 2.45, Chamber Music. 3.45, Talk with Gramophone illustrations—In the Rumanian Mountains. 4.15, Wind Instrument Concert. 5.50, Talk: Linke-Crawford, an Austrian Aviator of the Great War. 6.20, Brahms Song Recital by Gertrude Rünger. 6.50, Time, Sports Notes and Programme Announcements. 7.0, Die Försterchristl—Operetta in Three Acts (Georg Jarno). In an interval at 8.15, News. 9.15, Concert from the Hotel Krantz Ambassador. Announcements after the Programme.

WARSAW

POLSKIE RADIO, 212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from the Tower of St. Mary's Church, Cracow. 11.5, Programme Announcements. 11.10, Weather. 11.15, Beethoven Concert. In the interval, Talk. 1.0 p.m., Talk. 1.15, Agricultural Market Prices. 1.25, Gramophone Music. In the interval, Announcements. 2.0, Talk. 2.20, Light Music by the Adamska-Grossmann Orchestra. 3.0, Programme for Children, relayed from **Lwów, 788 kc/s, 381 metres.** 3.30, Gramophone Records of Celebrated Artists. 3.45, Reading. 4.0, Talk. 4.15, Suite, Polish Wedding (Nowowieski), by the Station Symphony Orchestra, conducted by the Composer. 5.0, Dramatic Programme. 5.40, Song Recital by Mme. Mech. 6.0, News. 6.5, Miscellaneous Items. 6.30, Review of the Week's Events. 6.45, Programme Announcements. 6.50, Variety Programme by Mira Ziminska, Casimir Krukowski and Walter. 7.50, Radio Journal. 8.0, Topical Talk. 8.15, Humorous Programme, relayed from **Lwów.** 9.15, Sports Notes. 9.25, Dance Music relayed from the Adria Café. In the interval at 10.0, Aviation Weather Report and Police Notes.

WILNO

530 kc/s, 566 metres; 16 kW.—6.10 p.m., Gramophone Music. 6.20, Miscellaneous Items. 6.30, See **Warsaw.** 6.45, Programme Announcements. 6.50, See **Warsaw.** 8.15, Humorous Programme, relayed from **Lwów, 788 kc/s, 381 metres.** 9.15 till Close Down, See **Warsaw.**

ZURICH.—See **Schweizerischer Landessender.**

NOV. 5th SUNDAY *continued*

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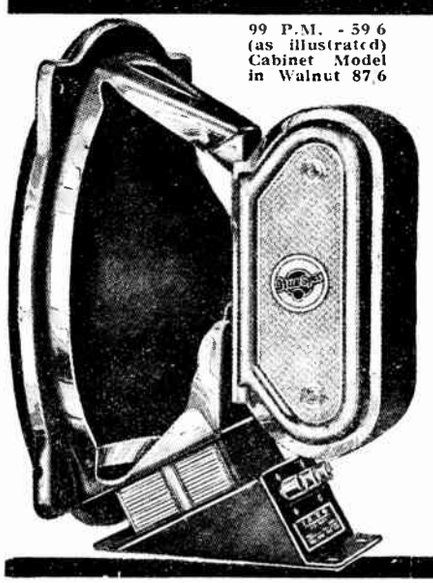

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MONDAY
NOVEMBER THE SIXTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes, Agricultural Report, and Weather. **7.20,** Agricultural Talk. **7.35,** Operetta Music: Airs from The Land of Smiles (Lehár); Frasquita (Lehár); La cocarde de Mimi Pinson (Goublier); and Comte Obligado (Moretti). **7.55,** News. **8.0,** Time and Lottery Results. **8.10,** Concert by the Station Symphony Orchestra, conducted by Henry Defosse: Symphony No. 8 (Beethoven); Viola Concerto (Handel); Ballad (Liadov); Spanish Caprice (Rimsky-Korsakov). In the interval at **8.35,** News and Gramophone Records. **9.30,** News. **9.35,** Popular Songs. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,328 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.**—**1.30 to 2.30 p.m.,** Time, Weather, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gaelic Talk. **7.15,** Talk for Poultry-keepers. **7.30,** Time Signal. **7.31,** The Station Orchestra. **7.50,** Gaelic Song Recital. **8.5,** Traditional Fiddle Music. **8.15,** Violin Duets. **8.45,** Variety Programme. **9.15,** The Station Orchestra. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Light Music: Bells across the Meadows (Ketelbey); Song, Smilin' through (Penn); Selection from Wonder Bar (Katscher); Spanish Gipsy Dance (Marquina). **9.45,** Popular Melodies: Signature Tune, Love is the Sweetest Thing; Under a blanket of blue (Symes); Jealousy (Gade); In the Park in Paree (Rainger); Reflections in the Water (Loeb); Signature Tune, Love is the Sweetest Thing. **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Dance Music: The Grass is getting greener; Aintcha got Music?; Castles in the Air; Maria my own; Stormy Weather; Deep Water; Twenty Million People. **10.30,** Time, News and Weather. **10.40,** Irish Music. **11.0,** Close Down.

BARCELONA

EAJI, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Trio No. 5 in G (Mozart); Träumerei (Wagner); Plaisir d'amour (Martini); Barcarolle (Mendelssohn); Serenade (Moszkovsky). **7.0,** Request Gramophone Music. **7.20,** Sports Notes. **7.30,** Exchange and Talk in Catalan. **8.0,** Gramophone Music and News. **8.30,** Catalan Educational Programme: Geography and History Lessons. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5** (approx.), Humorous Review of the Week in Verse. **9.15,** Concert of Sardanas. **10.0,** Concert by the Radio Orchestra: Overture, The Ruins of Athens (Beethoven); Suite from Der Rosenkavalier (R. Strauss).—**10.30,** Catalan Radio Gazette. **11.0,** Quintet Concert relayed from the Café Español. In the interval, News. **12.0 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Gramophone Music. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15 to 7.45,** See **Rome. 7.45,** Chamber Music by Gioconda de Vito (Violin), Franco Ruggiero (Pianoforte), and Enza Motti Messina (Soprano). Violin Solos: (Pugnani-Polo): (a) Largo, (b) Allegro brillante, (c) Rondo. Pianoforte Solos: (a) Acque corronti (Cilea), (b) Etude (Liszt), (c) L'Isle joyeuse (Debussy). Violin Solos: (a) Melody from The Violin-Maker of Cremona (Hubay), (b) March Caprice No. 14 (Paganini). Soprano Solos: (a) Aria from Alceste (Gluck), (b) El pescador (Turina), (c) Two Romanian Songs (Golestan). Violin Solos: (a) Spanish Serenade (Chaminade-Kreisler), (b) The Flight of the Bumble Bee (Rimsky-Korsakov). After the Programme, Talk. **8.45** (approx.) till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**5.55 p.m.,** Time and Programme Announcements. **6.0,** Concert by the Radio Orchestra. **7.0,** Talk. **7.30,** An Opera relayed from the National Theatre. In an interval at **9.0,** Time and News.

BERLIN

DEUTSCHLANDSENDER, REICHSSENDER, 183.5 kc/s, 1,635 metres; 60 kW.—**11.5 a.m.,** Tchaikovsky Concert on Gramophone Records. **11.55,** Time Signal. **12.45 p.m.** News. **1.0,** Gramophone Concert of Popular Songs. **1.30 p.m.,** The Watchword. **1.35,** Concert (contd.). **2.0,** Concert by the Bernhard Dercksen Orchestra: Waltz, Liebeslieder (Joh. Strauss); Nina (Pergolesi); Sérénade mélancolique (Tchaikovsky); Liebeswerben (Dercksen); Selection from The Bird Fancier (Zeller). **2.30,** Weather and Exchange. **2.45,** Reading (Robert Reinick). **3.0,** See **Breslau. 4.0,** Fourteen Days of the Red Terror in Vogtland—Radio Sequence (Ottoheinz Jahn). **4.20,** Classical and Romantic Music. Part I—Harpsichord Music. Polonaise, Minuet, Musette and March (Bach); Minuet and Gavotte (Handel); Die Seiltänzerin (Marpurg); Allegro in D (Haydn). Part II—Songs. Der kleine Schritt (Weber); Der Kuss (Beethoven); Warnung (Mozart); Die Kartenlegerin (Schumann): Spatz und Spätzin (Hildach); Four Songs (Wolf); Bei einer Trauung; Mausfallensprüchlein; Abschied; Storchenbotschaft; Der Dieb (Reger); Das Hemd (Trunk). **5.0,** The Watchword. **5.5,** The November Sun—a Quiet Interlude . . . **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** To-day's Motto. **7.5,** Wilhelm Busch Programme—a Radio Sequence (Heinz Schwitzke). **8.0,** Request Concert of Gramophone Music. **9.0,** News. **9.45,** Weather. **10.0,** See **Munich. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE** (See Short-Wave List).—**3.30 p.m.,** Concert by the Hans Raue Quintet: **4.30,** Examining a House—Discussion by the Housewife, the Architect, and a Guest. **4.50,** Radio Sequence. **5.10,** Quintet Concert (contd.). **5.25,** To-day's Watchword. **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.5,** German Opera Music (on Gramophone Records). **8.0,** Kommt ein Vogerl geflogen—Radio Report. **8.15,** Concert of Chamber Music, conducted by Hans von Benda; Soloist, Karl Linder (Organ): Organ Concerto in F (Handel); Organ Concerto, Op. 15 (Coenen). **9.0,** News. **9.15** (approx.), Light Music and Dance Music by the Hans Raue Quintet, with Gramophone Interludes. In an interval at **10.0,** Police Notes. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW. **6.15 p.m.,** Radio Journal. **7.30,** News, Racing Results and Market Prices. **7.35,** Talk: Bordeaux a Century Ago. **7.50,** Lottery Results and Charades. **8.0,** Gramophone Music. **8.15,** News. **8.30,** Concert of Classical and Modern Music.

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**5.5 p.m.,** Violin Recital by Eduard Zathurecky. **5.50,** See **Prague. 5.55,** Talk relayed from **Kosice, 1,022 kc/s, 293 metres. 6.10,** Radio Play. **7.15,** See **Brno. 7.35,** Concert by the Station Orchestra, conducted by Dyk. Soloist: Ibl (Violin). **8.55,** See **Moravská-Ostrava.**

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**12 Noon,** Weather. **12.5 p.m.** (approx.), Popular Music on Gramophone Records. **12.45,** Time and News. **1.10,** Pianoforte Recital by Charlotte Brettschneider: Two Pieces (Chopin): (a) Waltz in E minor, (b) Waltz in C sharp minor; Humoresque, Op. 20 (Schumann). **1.35,** The Day's Watchword. **1.40,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices. **2.15,** Photos and Films—Book Review. **2.35,** Legal Talk. **3.0,** Concert by the Silesian Symphony Orchestra, conducted by Walter Mundry: Overture, The Black Domino (Auber); Swedish Flute Concerto (Popp); Hungarian Suite (Hofmann); Waltz, Bei uns z' Haus (Joh. Strauss); Overture, The Queen's Kerchief (Joh. Strauss); Introduction and Chorus from Carmen (Bizet); Selection from The Mastersingers (Wagner); Madrigal (Simonetti); Waltz from Das Fürstenkind (Lehár); Selection from Die Puppenfee (Bayer). **4.45,** Agricultural Prices. **4.50,** The Worker's Homecoming—Radio Picture. **5.10,** Programme to be announced. **5.25,** The Day's Watchword. **5.30,** Legal Talk. **5.50,** Meat Market Prices. **6.0,** Transmission for all German Stations; Johann Strauss—the Waltz King; Concert by the Silesian Choir and by the Silesian Philharmonic Orchestra, conducted by Ernst Topitz; Soloists: Elsa Kochhann (Soprano) and Anton Maria Topitz (Tenor): Intermezzo from The Arabian Nights; Duet from Jabuka; Romance in D minor; Duet from Indigo; Neue Pizzikati-Polka from Fürstin Ninetta; Song, Und doch es war so wunderschön! from Der Waldmeister; Serenade, Mit der Würde, die Dir eigen, from Eine Nacht in Venedig; Musical Joke, Perpetuum mobile; Duet from Prince Methuselah; Overture, Die Fledermaus. **7.0,** News. **7.10,** Light Music and Dance Music by the Station Orchestra, conducted by Ernst J. Topitz; Soloists: Esla Kochann (Soprano) and Anton Maria Topitz (Tenor). **9.0,** Time and News. **9.25,** Wireless Technical Talk. **9.35,** Organ Recital by Gerhard Zeggert, relayed from the Christopherikirche: Prelude in E minor (Brahms); Passacaglia in D minor (Buxtehude); Variations on Mein junges Leben hat ein End (Sweelinck); Organ Choral; Nun ruhen alle Wälder. **10.10** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**6.10 p.m.,** Variety Concert. **7.15,** Concert of Moravian Folk Songs by the Brno Male Voice Quartet. **7.35,** A Scene in a Kirghiz Village—Dramatic Programme. **8.15,** Concert by the Station Orchestra, conducted by Bakala. Soloist: Jindrich Polasek (Violin). Toccata, Bourrée and Gigue (Scarlatti); Violin Concerto, Op. 29 (Krenek); Suite (Krejci). **9.15,** See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Chal Romano (Ketelbey); Waltz, The Passing of Salome (Joyce); Spanish Serenade (Douliez); Selection from The Daughter of the Regiment (Donizetti); Violin Solo: Russian Airs, Souvenir de Moscou (Wieniavsky); Potpourri, Contrasts (Robrecht); L'orgue de barbarie (Candiolo); Kiss Waltz (Burke); Foxtrot, Dizzy Fingers (Confrey). **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert: Selection from Princess Charming (Waller); Waltz, Die Schönbrunner (Lanner); Honeysuckle (Mayerl); Selection from One Hour with You (Robin-Whiting-Strauss); Second Serenade (Heykens); Russian Gipsy Melodies, A Russian Night at the Hungaria; Tarantella (Coates); Selection from The Maid of the Mountains (Fraser); Mignonette (Mayerl); The Skaters' Waltz (Waldteufel). **5.0,** Orchestral Concert, relayed from the Plaza. **6.0,** Medical Talk. **6.15,** Gramophone Music: Puppenparade (Rathke); Selection from Louise (Charpentier); Air from Manon (Massenet). **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Ouverture héroïque (Guillemyn); Suite No. 2 (Micheli); Symphonic Sketch, Aurore (Leemans); Selection from Dalibor (Smetana); 'Cello Solo: Allegretto (Boccherini); Valse triste (Sibelius); Violin Solo: Burlesque (Chaumont); Suite internationale (Tchaikovsky). **7.30,** Theatre and Film Review. **8.0,** Gramophone Music: Selection from Tsar Saltan (Rimsky-Korsakov); Sonata in F minor (Brahms). **8.30,** Orchestral Concert, conducted by De Vocht, relayed from **Antwerp.** Soloists: Maurice Maréchal ('Cello). Symphony No. 4 (Tchaikovsky); 'Cello Concerto (Dvorák); Two South American Sketches (Bourguignon); 'Cello Solos; Overture, The Bartered Bride (Smetana). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—**12 Noon,** Gramophone Concert: French Military March (Saint-Saëns); Potpourri of Swiss Songs and Marches (Häusser); Two Pieces (Ravel): (a) Menuet antique, (b) Piece from L'enfant et les sortilèges; Arioso (Händel); Oriental Suite (Popy); Overture, Figaro (Mozart); Quadrille from Orpheus in the Underworld (Offenbach); Hofballtanze (Lanner); Regimental March (Moreau). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Undine (Lortzing); Waltz Potpourri, Around the Volga (Borchert); Serenade (Braga); Selection from Le coeur et la main (Lecocq); Two Old Dances (Razigade); Burlesque (Poot); Slav Dance No. 8 (Dvorák). **5.0,** Concert by the Radio Orchestra, conducted by Walpot: Overture, The Bohemian Girl (Balfe); Bosphorus (Baeyens); Selection from The Land of Smiles (Lehár); Violin Solo: Meditation (Maes); Flots sur la grève (Lulin); Suite, Vasconia (Lacome). **5.45,** Programme for Children. **6.30,** Symphony No. 7 (Beethoven), on Gramophone Records. **7.12,** News. **7.15,** Talk. **7.30,** Theatre Review. **8.45,** De Zaak van Spoel—Radio Play (Dirickx). **9.0,** Concert by the Radio Orchestra, conducted by Walpot: Overture, The Secret Marriage (Cimarosa); Pianoforte Solos: (a) The Lark (Balakirev), (b) Valse brillante Op. 34, No. 1 (Chopin); Two Pieces (Albéniz): (a) Sambra granadina, (b) Sevilla; Pianoforte Solo; Vecchio minuetto (Sgambati); Old and Modern Airs (Salabert); Pianoforte Solo; Tarantella (Liszt); Chinese Rhapsody (Gabriel-Marie). **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**11.0 a.m.,** Gramophone Music. **12 Noon,** Radio Journal. **12.15 p.m.,** Gramophone Music (contd.). **4.0,** Concert by the Station Orchestra: Two Marches from Alceste (Gluck); Waltz Salome (Joyce); Comedy Overture (Keler-Bela); Selection from I Pagliacci (Leoncavallo); Children's Suite (Blech); Selection from The Rose of Stamboul (Fall); Stéphanie Gavotte (Czibulka); Serenade (Grieg); Aubade (d'Ambrosio); At the Altar (Sinigaglia). In the interval at **5.0,** Radio Journal and Songs. **6.0,** Educational Programme. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Quartet in E minor, Op. 59, No. 2 (Beethoven) by the Servas Quartet. **7.30,** Talk. **7.45,** Song Recital by Mia Petela. **8.15,** Pianoforte Recital by Gruia. **8.45,** Romanian Music by the Station Orchestra.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **6.40 p.m.** till Close Down. **4.20,** Light Music by the Weidinger Orchestra. **5.30,** Reading. **6.0,** Song Recital by Koncz. **6.40,** Concert by the Philharmonic Society, conducted by Ernst Dohnanyi, relayed from the Royal Hungarian Opera House. Soloist: Alma Moodie (Violin); Symphony in D (Volkmann); Violin Concerto in E (Bach); Symphony No. 2 (Beethoven). **9.0,** News, followed by Trio Concert, relayed from the Café Simplon. **10.0,** Concert by the Eugen Farkas Cigány Band, relayed from the Spolarich Café.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres,** and **Skamlebaek, OXY, 31.51 metres.**—**11.0 a.m.,** Town Hall Chimes. **11.2 to 1.0 p.m.,** Concert from the Wivex Restaurant. **2.20,** Talk for the Housewife. **2.30,** Concert by Louis Preil's Instrumental Ensemble; March, Colonel Bogey (Alford); Waltz, The Fairest in the Land (Ancliffe); Canzonetta, Gemma (Maclean); Hearts and Flowers (Tobani); Potpourri, Von Wien durch die Welt (Hruby); Serenade, Notte di stelle (Micheli); Intermezzo, Komm zu mir (Ganglberger); Mississippi lament (Wirges); Nocturne, L'heure bleue (Spoliansky); Tiny Tot (Fischer and Lotter); Poème d'extase (Bullerian); A darkey's dreamland (Thomas Bidgood); Waltz (Woodtham); Pianoforte Novelty, Kaskaden (Kapplusch). In the interval at **3.15,** Reading. **4.30,** Exchange and Market Prices. **4.45,** Talk. **5.15,** English Lesson. **5.45,** Weather and News. **6.15,** Time Signal. **6.30,** Talk: Jonas Lie. **7.0,** Town Hall Chimes. **7.2,** Concert of Popular Italian Opera Music by the Radio Orchestra, conducted by Launy Gröndahl: Overture, The Barber of Seville (Rossini); Selection from Il Trovatore (Verdi); Intermezzo from Cavalleria rusticana (Mascagni); Selection from Tosca (Puccini); Ballet Music from Aida (Verdi). **7.50,** Talk—Greenland. **8.20,** Concert of Scandinavian Music for Strings: The Radio String Orchestra, conducted by Launy Gröndahl, Ravnebryllup i Kragelund—Scandinavian Folk Melody (arr. Halvorsen); The Death of Aase from Peer Gynt (Grieg); An den Frühling (Grieg); Rigaudon from the Suite, Aus Holbergs Zeit (Grieg). **8.40,** Jonas Lie—Centenary Programme of Songs and Readings. **9.20,** News. **9.35,** Orchestral Concert, conducted by Launy Gröndahl: Two Pieces from Wedding Scenes (Smetana); A Hungarian Wedding Festival (Dohnanyi); Selection from Scènes alsaciennes (Massenet); Selection from Scènes napolitaines (Massenet). **10.10** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**6.5 p.m.,** Book Review. **6.20,** Miscellaneous Items. **6.25,** Talk: Humour in Chopin's Music, relayed from **Wilno, 530 kc/s, 566 metres. 6.40,** Programme Announcements. **7.0,** See **Warsaw. 10.0,** Sports Notes. **10.5,** Light Music from the Pavilion Restaurant. **10.30** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11 a.m. till 12 Noon,** Programme in English by the I.B.C.: Happy Hour; Part 1: Orchestral Concert: Overture, Morning, Noon and Night (Suppé); El relicario (Padilla); Piccolo Solo, Fluttering Birds (Gennin); The Golden Musical Box (Krome); Selection from Wonder Bar (Katscher); Song, There's Magic in the Air (Eyton); Kisses in the Dark (de Micheli); The Mill in the Forest (Eilenberg); Philco Signature Tune; Part 2: Dance Music: I've found the Right Girl; Tick, Tock; Snowball; Louisville Lady; The Wedding of Mr. Mickey Mouse; My Mother's Garden; Mary Rose; Sentimental Gentleman from Georgia; Signature Tune. **12 Noon,** Programme in French. **4.30 to 6.0 p.m.,** Programme in English by the I.B.C. **4.30,** The I.B.C. Nursery Corner. **5.0,** Orchestral Concert for Chichester and Bognor Listeners: Signature Tune, The Night by the Sea; Poor Butterfly (de Phillippi); Violin Solo, Souvenir (Drdla); Selection from Countess Maritza (Kálmán); Stop the Sun, stop the Moon (Robinson); Beautiful (Gillespie); El amor hace fruncir (Cupelro); Heartaches (Klenner); The Way to the Heart (Lincke). **5.30,** Concert of Gramophone Records for Hastings and Eastbourne Listeners: Veterans of Variety, Part 1: Just an Echo in the Valley (Woods); You did everything for me (Connelly); Sweet Sue, Just You (Young); Marching through Georgia (Work); Tony's Wife (Adamson); Song, Mountain Lovers (Squire); Veterans of Variety, Part 2: Signature Tune. **6.0,** Programme in French. **10.0** (approx.) till Close Down, Programme in English by the I.B.C. **10.0** (approx.), Dance Music: Signa-

ture Tune. The Bells of Normandy; Isn't this a Night for Love; I bring a Song; Sing another Line; Lazy Bones; Wedding of the Dragonflies; What a Perfect Combination; Sweet Dreams, Pretty Lady; Carry me back to green, green Pastures; A Girl like Nina; Egypt; Sadie the Shaker; Mary Rose; I've found the Right Girl; Don't blame me; They do the Rumba; Lovers' Lane; My Moonlight Madonna; Signature Tune. **11.0,** Talkie Time; Tunes from the Talkies: Signature Tune, Sittin' in the Dark; Happy Days are here again; What a perfect combination; Selection from Il est charmant; One Little Drink; Song, I've found the Right Girl; There'll still be Love; Pianoforte Solo, Everybody says I Love You; Come out Vienna (Strauss). **11.30,** Club Concert for Saltcoats, Ardrossan and Troon Listeners; Part 1, Military Music: Signature Tune, The Chum Song; The Bravest of the Brave (Dunn); Scotland's Pride; The Teddy Bears' Picnic (Bratton); Selection from Florodora (Stuart); In a Monastery Garden (Ketelbey); The Turkish Patrol (Michaels); Down South (Myddleton); March, Stars and Stripes (Sousa). **12.5 a.m. (Tuesday),** Fanfare of Trumpets and News Bulletin in English. **12.10** (approx.), Club Concert; Part 2: Sweetness; My favourite Band; Mama Inez; Good Evenin'; Music hath Charms; Signature Tune. **12.30,** Dance Music: Sentimental Gentleman from Georgia; Look what you've done; Oh Johanna; Mademoiselle; The Wedding of Mr. Mickey Mouse; Aloha Oe; Happy as the Day is long; Sundown in a little green Hollow. **1.0,** Dance Music: Signature Tune, The Bells of Normandy; Selection from Dinner at Eight; You're an Old Smoothie; The Shadow Waltz; I'll take an option on You; Down in the Valley; Cecilia Mia; I'll show you off; Avalon; Nunca; It's Sunday down in Caroline; I've got to pass your House; Tick, Tock; Mi amor esta en el Valle; Let's call it a Day; Isn't it Heavenly?; The last round up; Signature Tune. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** See **Stuttgart. 1.40,** Humour in German Songs. **2.30,** Weather. **2.40,** Time and Exchange. **3.0 to 5.40,** See **Stuttgart. 5.40,** Programme to be announced. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** Topical Talk. **7.10,** Second Monday Concert of the Frankfurt Orchestral Society, conducted by Hans Rosbaud. Soloist: Walter Giesecking (Pianoforte). Fugue from the String Quartet, Op. 133 (Beethoven); Concerto in D, Op. 83, No. 2, for Pianoforte and Orchestra (Brahms). **8.15,** Nicotine Poisoning—Radio Play (Hans Knan). **9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News and Weather. **9.45 to 11.0,** See **Stuttgart. 11.0,** See **Langenberg. 12 Midnight,** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—**6.0 p.m.,** Transmission for all German Stations relayed from **Breslau. 7.0,** German Legends—Concert by the Small Station Orchestra, conducted by Adolf Secker, with Bernhard Jackschtat (Songs) and Clare Goericke and Karl Pündter (Recitations). **8.10,** Concert from the Colisemn, Lübeck. The Lübeck Municipal Orchestra, the Lübeck Choral Society, and Hermann von Beckerath ('Cello). 'Cello Concerto (Dvorák); Song of Destiny for Chorus and Orchestra (Brahms). **9.0,** News. **9.20** (from **Kiel**), Orchestral Concent conducted by Hans Döring: Wedding March, Als der Grossvater die Grossmutter nahm (Spohr); Spanish Comedy Overture (Kéler-Bela); Paraphrase, Abendlied (Weninger); Selection from Die Königskinder (Humperdinck); Die Dorfschmiede (Heinz); Potpourri, A Wedding Journey through Scandinavia (Juel-Frederiksen); Ballet Overture (Lincke); Ständchen an die Geliebte (Blon); Ninetta-Walzer (Joh. Strauss); March, Hand in Hand (Blon).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**12.30 to 1.30 p.m.,** Tchaikovsky Concert on Gramophone Records. In the intervals at **12.20** and **1.0,** News. **1.40,** Programme for Boys. **2.0,** Market Prices. **2.25,** Talk. **2.30,** Talk: The Glamour of the Stage. **3.0,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. Technical Talk in the interval. **4.50,** Talk. **4.55,** Elementary English Lesson. **5.15,** Agricultural Notes. **5.25** (from **Danzig**), Humorous Tales of Danzig. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** News and Weather. **7.10** (from **Danzig**), Song Recital by Emmi Leisner. **7.40,** An Interview with Aida Stukering: Hollywood. **7.50,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken and Soloists. Overture, The Daughter of the Regiment (Donizetti); Flute Solos: (a) Andante cantabile (Tchaikovsky), (b) Waltz No. 1 (Durand); Violin Solo: Hejre Kati (Hubay); Concertino for Oboe and Pianoforte (Flemming); Fantastic Waltz (Wilcken); Trumpet Solo: Singing Birds from the Thuringian Forests (Hoch); Overture, The Queen's Kerchief (Joh. Strauss); Wiener Bilderbogen for Pianoforte and Orchestra (Börschel). **9.0,** News and Weather.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to **5.40 p.m.,** and 20 kW from **5.40 p.m.** Programme of the General Broadcasting Society (A.V.R.O.).—**10.40 a.m.,** Organ and Song Recital by van Doorn and Fenny van Andel-Romijn. Organ Solos: (a) Fugue in G Minor (Bach), (b) Allegro moderato and Adagio from the Concerto in D Minor (Stanley); Songs with Organ Accompaniment (Bach): (a) Ich hatte viel Bekümmerniss, (b) Ich hab in Gottes Herz und Sinn; Organ Solo: Prelude and Fugue on the Theme B.A.C.H. (Liszt); Songs with Organ Accompaniment: (a) Largo (Handel), (b) Aria from St. Paul (Mendelssohn), (c) Letzter Frühling (Grieg); Organ Solos: (a) Cantilène pastorale (Guilmant), (b) Triumphal March (Lemmens). **11.40,** Time Signal. **11.41,** Concert of Light Music by the Rentmeester Orchestra. In the intervals, Gramophone Music. **1.55,** Interval. **2.10,** Pianoforte Recital by Sophie Vos: Pastorale (Scarlatti-Tausig); Sonata, Op. 26 (Beethoven); Nocturne, Op. 48, No. 1 (Chopin). **2.40,** Gramophone Music. **3.40,** Dance Music by Paul Godwin and his Band. **4.10,** Lecture Recital of Slav Music. **5.10,** Concert of Light Music. **5.40,** Gramophone Music. **6.10,** Light Music. **6.40,** Talk on Iceland. **7.10,** Beethoven Concert by the Wireless Orchestra, conducted by Albert van Raalte. Soloists: Di Moorlag (Soprano) and Frederic Lamond (Pianoforte): Symphony No. 8 in F; Soprano Solo: Ah, Perfidio; Rondino; Pianoforte Concerto No. 4 in G, Op. 58. In an interval at **7.40,** Time and News. **8.40,** King Henry VIII—Radio Play (van Moerkerken). **9.15,** Concert of Light Music by Kovacs Lajos and his Orchestra. **10.40,** News. **10.50,** Gramophone Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW from **3.40 p.m.** Programe of the Christian Radio Society (N.C.R.V.).—**12.10 p.m.,** Organ Recital by Jan Zwart: Sonata No. 1 (Mailly); Preludes (Oranje); Two Psalms; Gebed des Heeren; Psalm 105; Symphony No. 2 (Widor); Preludes (Zwart); Four Psalms. **1.40,** Broadcast for Schools. **2.15,** Gramophone Music. **2.25,** Cookery Lesson. **2.55,** Dressmaking Lesson. **3.25 to 3.40,** Interval. **3.40,** Bible Reading and Sacred Song Recital. **4.40,** Concert by Mlle. de Haas (Soprano), Mlle. Laguna (Violin), and Hans Laguna-del Valle (Pianoforte): Lydisches Brautlied (Handel); O hätt ich Jubals Harf (Handel); Ch'u moi vi possa (Handel); O cessate di piagami (Scarlatti); Sonata in F (Beethoven); Soprano Solos: (a) Das Veilchen (Mozart), (b) An Chloé (Mozart), (c) Wiegenlied (Mozart); Gramophone Records; Sonata in E Minor (Corelli); Soprano Solos: (a) Der Nussbaum (Schumann), (b) Volksliedchen (Schumann); Sonata in E Minor (Mozart); Mijn lieveken, zeg herinnert ge 't U (v. Rennes); Song (Sweers); Andante in B Minor (Vieuxtemps). **6.10,** Programme to be announced. **6.40,** Police Messages. **6.55,** Religious News. **7.10,** Answers to Correspondence. **8.10,** Temperance Programme—Talks and Musical Items. **9.10,** Choral Concert, conducted by Couvée. In the interval at **9.40,** News. **10.40,** Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide. News, Financial Notes, and Racing Results. **8.10,** Sports Notes. **8.25,** Light Music. **8.45,** News and Weather. **9.0,** Mark Twain Programme.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.,** News and Weather. **12.35,** See **Stuttgart. 1.30,** Meat Market Prices. **2.0,** A Report on Scientific Research. **2.30,** Exchange. **2.50,** Political Announcements. **3.0,** See **Stuttgart. 5.50,** News. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News, Weather and Sports Notes. **9.45,** See **Stuttgart. 11.0,** Serenade by the Station Orchestra, conducted by Buschkötter. **12 Midnight,** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**12.30 p.m.** (from **Dresden**), Concert of Schrammel Music: March, Am Wöthersee (Koschat); Prelude to Die Hochzeitsnacht (Schwarz); Viennese Song, Der Schwalbe Gruss (Schrammel); Ländler of the Schliersee; Blumengeflüster (Blon); Song, Die Berge sind meine Heimat (Birkhofer); Waltz Idyll, Ein Sonntag auf der Alm (Koschat); Bavarian Ländler; Carinthian March (Seifert). **1.15,** News. **1.30,** Notes on Art. **1.40,** Review of Books for Girls. **2.10,** A Radio Sequence. **2.30,** The Watchword. **2.35,** Exchange. **3.0,** Concert Relay. **4.30,** Readings from German Classics—Wigalois. **4.50,** A Finnish Woman's Impressions of Germany (on Gramophone Records). **5.0,** Dances from Many Lands (on Gramophone Records). **5.40,** The Watchword. **5.45,** Exchange and Review of the Day's News. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** Symphony Concert by the Leipzig Symphony Orchestra, conducted by Hans Weisbach; Soloist, Dusolina Giannini (Songs): Leonora Overture No. 3 (Beethoven); Aria from La Vestale (Spontini); Cella azura (Rocca); Aria from La Gioconda (Ponchielli); Symphony No. 7 in A, Op. 92 (Brahms). In the interval from **7.45 to 8.5,** Anecdotes about Musicians. **8.50,** News. **9.0** (approx.), Programme to be announced. **9.45,** Vocal and Instrumental Concert of Light Music: Scandinavian Melodies for Violin and Guitar (Blomquist); Swedish Melodies for Baritone, with Guitar Accompaniment (arr. Blomquist): (a) Ich gönn dir alles Gute doch, (b) Tief im Meere, (c) Das Meerweib, (d) Ich tadle gar kein Mädelein; Pianoforte Solos: (a) German Dance (Schubert), (b) Dance (Pamer); Zither Solo, Intermezzo (Svonbada); Baritone Solos, with Zither Accompaniment: (a) Vor Jena (Stade), (b) Nassau Folk Melody, Das goldne Ringelein; Pianoforte Solos: (a) German Dance (Schoberlechner), (b) Waltz (Conradin Kreutzer); German Peasant Dances for Zither (Grünwald); Four Pieces for Flute and Pianoforte, Op. 54 (Blumer); Five Duets for Violin and Viola (Mozart); Tarantella in A flat, Op. 85, No. 2 (Heller). **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.,** Programme for Women. **5.30,** Agricultural Talk **6.0,** Gramophone Music. **6.30,** Foreign Press Review. **7.0,** Gramophone Music. **7.30,** An Opera, relayed from the National Theatre, **Belgrade.** In an interval, Weather and News.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—Italian Evening. **7.0 p.m.,** Selection from Rigoletto (Verdi), on Gramophone Records. **7.50,** Concert of Italian Music by the Station Orchestra, conducted by Pensis: Overture, Ali Baba (Cherubini); Selection from Zaza (Leoncavallo); Minuet (Boccherini); Caro mio ben (Giordano); Mattinata (Leoncavallo); Ballet Music from La Gioconda (Ponchielli); Selection from La Bohème (Puccini); **8.50,** News in French. **9.0,** Recital of Italian Songs and Arias: Dormi pure (Scuderi); Il Libro santo (Pinsuti); Song (Tosti); Sacred Aria (Stradella); Aria from Tosca (Puccini); Aria from Rigoletto (Verdi). **9.30,** Violin Concerto (Paganini), on Gramophone Records. **9.50,** News in German. **10.0,** Concert by the Station Orchestra, conducted by Henri Pensis: Overture, La belle Hélène (Offenbach); Three Pieces (Wallet); Fauns and Nymphs (Königsberger); Sous Bois Mouton); The Rosary (Nevin); Baby plays Soldiers (de Micheli). **10.30,** Dance Music on Gramophone Records.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.,** Talk. **6.15,** Announcements. **6.25,** Music Talk, relayed from **Wilno. 6.40** till Close Down, See **Warsaw. 10.30** (approx.), Close Down.

LYONS

644 kc/s, 465.8 metres; 1.5 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.45,** Concert of Instrumental Music. Soloist: Arthur de Greef (Pianoforte). Norwegian Rhapsody (Svendsen); Toccata, Bourrée and Gigue (Scarlatti-Casella); Pianoforte Concerto (Bach); Sarabande and Dance (Debussy-Ravel); Overture in Italian Style (Schubert); Valse triste (Sibelius); The Flight of the Bumble Bee (Rimsky-Korsakov); Pianoforte Concerto in D minor (Mozart); Music for Radio (Lazar). After the Concert, News.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Popular Music. **10.45,** Radio Chronicle. **11.0,** Programme for Catalanians Abroad. **12.0 Midnight** till Close Down, Programme in English by the I.B.C. Concert of Light Music; Regiment of Peace (Reisfeld); After Love (Erwin); Only a Rose (Friml); Speak Easy (Gensler); Hobo, you can't ride this Train (Armstrong); Selection from Viktoria and her Hussar (Abraham); Please (Robin); Selection from The Count of Luxembourg (Lehár). **12.30 a.m. (Tuesday),** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Radio Journal and Dance Music. **8.15,** Topical Review. **8.30** (approx.), Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Plichta: Fantasia on Themes of Tchaikovsky (Urbach); Serenade for Violin and Orchestra (Sebestik); Polka (Ridky); Selection from Paganini (Lehár); Slovak Dance (Smatek). **3.50,** See **Prague. 4.5,** Gramophone Music. **4.15,** Sports Notes. **4.25,** See **Prague. 4.50,** Gramophone Records. **5.0,** Talk. **5.15,** See **Prague. 5.30,** German Transmission: Talk and Reading. **5.50,** See **Prague. 5.55,** Talk relayed from **Kosice, 1,022 kc/s, 293 metres. 6.10,** See **Brno. 8.15,** Concerto in B minor, Op. 23 (Tchaikovsky) by the Station Orchestra and Rosenbergova-Schindlerova (Pianoforte). **8.55,** Dance Music.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.**—**10.45 a.m.,** Weather. **1.15,** Literary and Musical Programme. **1.45,** Weather. **2.0,** Popular Concert. **3.30 to 10.0,** Programme from **Moscow (Komintern), 205.5 kc/s, 1,481 metres. 3.30,** Gramophone Music. **4.0,** Festival Concert, relayed from the Grand Theatre. In the interval, News, Announcements and Programme Notes. **10.0,** Talk in Hungarian: Preparations in Moscow for the October Festival.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**3.30 p.m.,** Orchestral Concert, conducted by Erich Kloss: Overture, The Italian Girl in Algiers (Rossini); Two Pieces (Rimsky-Korsakov): (a) Hindu Song, (b) Flight of the Bumble Bee; Selection from La Bohème (Puccini); Waltz, Geistesschwingen (Lanner); Suite, A Chinese Picture Sheet (Mauss); Preludes for two Violins (Veesey); Elfengeflüster (Rhode); Gallop, Perpetuo (Larsen). **4.40,** Review of Books. **5.0,** The Watchword. **5.5,** Talk: Early Career of Richard Strauss. **5.25,** Review of Books. **5.45,** Time, Weather and Market Prices. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** Die Leich (The Corpse)—a Munich Comedy (Martin Lankes). **7.25,** Concert by the Station Orchestra, conducted by Karl List: Alte Kameraden (Teike); Overture, Maritana (Wallace); Waltz, Donausagen (Fueik); Paraphrase on the Song La Paloma (Mannfred); Waltz, Pierrette (Rupprecht); Czardas (Michiels); Petersburger Schlittenfahrt (Eilenberg). **8.15** (from **Nürnberg**), Variety Programme. **9.0,** Austria. . . . **9.20,** Time and News. **10.0,** Dance Music. **11.0** (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredrikstad. 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy, LCL.**—**4.0 p.m.,** Concert by the Radio Ensemble: March, Washington Post (Sousa); Waltz, Kind, Du kannst tanzen (Fall); Selection from Frasquita (Lehár); Un poco triste (Suk); In the Harbour of Port Said (Armandola); Ochsenmenuett (Haydn); Cherry Ripe (Scott); Polka pizzicato (Jos. Strauss); Mazurka (Wieniawski). **5.0,** German Lesson. **5.30,** A Visit to the Country with the Microphone. **6.0** Announcements, Weather and News. **6.30,** Technical Talk: The Prevention of Rust, relayed from **Trondheim 605 kc/s 495.8 metres. 7.0,** Time Signal. **7.1,** Concert for the Centenary of Jonas Lie relayed from the University: The Philharmonic Orchestra, conducted by Kielland, a Student's Choir and Soloists. Addresses by Professors Sem

Seland Knut, Liestöl and Paasche Aason. Recitations by Gunnar Reiss Andersen and Halfdan Christensen. Sonata in C minor for Violin and Pianoforte (Grieg); Sangerhilsen (Grieg); Femböringen (Monrad Johausen). 8.40, Weather and News. 9.0, Topical Talk. 9.15, Baritone Solos by Kristiffer Ihle. 9.40 (approx.), Close Down.

ÖSTERSUND.—See **Stockholm.**

PARIS

EIFFEL TOWER. Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.**, (Preliminary and 6-Dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.30,** Gounod Concert on the Fortieth Anniversary of his Death: The Station Symphony Orchestra, conducted by Flament: Extracts from Philémon et Baucis; Ballet Music from Romeo and Juliet; Funeral March of a Marionette; Ave Maria, on a Theme by Bach; Overture, Mirella; Selection from Faust. In the interval at **8.0,** Talk on Home Affairs. **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Bolero (Ravel) on Gramophone Records. **7.15,** Le Journal Parlé. **7.30,** Hot Jazz (on Gramophone Records). **8.0,** Talk on Motor Cars. **8.5,** Medical Talk. **8.35,** Humorous Programme by Max Régnier and his Singers. **9.25,** Concert. **10.30,** News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** Press Review and Weather. **12 Noon,** The Music-Hall—Gramophone Concert: Liberty March (Messier); The Clown's Dog (Messier); Songs: (a) Berceuse d'amour (Delmet-Boukay), (b) C'était un rêve (Maquis), (c) Joujou (Borel-Clerc), (d) Les Reines de Paris (Dequin); One-Step, Miami (Loyraux); Xylophone and Vibraphone Solos: (a) Bye-bye Blues (Hamm-Bennet), (b) Vous me rendez fou (Hamm-Bennet), (c) Ne m'oubliez pas (Pether-Longy), (d) Cupid on the Cake; Tango, Cachodora (Lomuto); Toujours pimpant (Avignon); Songs: (a) L'adorable cantilène (Spencer), (b) Mais vous êtes si jolie (de Gueydan), (c) Mon p'tit quinquin (Desrousseaux), (d) Les deux menetriers (Durand-Richepin); Saxophone Solos: (a) Spanish Dance (Granados), (b) Melody from Quo vadis (Nougués), (c) Saxophone Medley (Rosenthal); Songs: (a) Airs from Louis XIV (Parès-Van Parys), (b) On n'me comprends pas (Gavel), (c) Song from Begonia (Mercier-Pujol); Selection from Samson and Delilah (Saint-Saëns); Gnomeparade (Noack); Potpourri on the Volga (Borchert); Melody (Schwartz); One-Step, New York (Padilla). In the interval at **1.0 p.m.,** Exchange, News, and Weather, and at **1.30,** Exchange. **2.0,** Exchange. **3.45,** Exchange and Market Prices. **6.20,** Agricultural Talk, Weather, and Market Prices. **6.45,** Film Review. **7.0,** Book Review. **7.20,** Gramophone Music. **7.45,** Horticultural Talk. **8.0,** Two Opéras: (a) La Légende du Point d'Argentan (Fourdrain), (b) Las Toreras (Laparra). In the interval at **8.30,** News, Weather, and Sports Notes; at **8.40,** Review by Paul Reboux; and at **9.15,** Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.,** Musical Originalities, from **New York.** **7.30,** KDKA Home Forum. **8.0,** Radio Guild, from **New York.** **9.0,** Betty and Bob, from **New York.** **9.15,** Programme to be announced. **10.0,** Uncle Tom and Betty. **10.15,** KDKA Kiddies' Klub. **10.30,** Singing Lady, from **New York.** **10.45,** Orphan Annie, from **New York.** **11.0,** News-Reeler: Pat Haley. **11.15,** Sports; Programme Preview. **11.30,** Evensong. **11.45 to 1.30 a.m. (Tuesday), New York** Relay. **11.45,** Lowell Thomas. **12 Midnight,** Amos 'n' Andy. **12.15,** Baby Rose Marie. **12.30,** Variety Programme. **1.0,** Popular Programme. **1.30,** Programme to be announced. **1.45 to 3.0, New York** Relay. **1.45,** Red Davis. **2.0,** Sinclair Minstrels. **2.30,** Melody Moments. **3.0,** Silver Toppers.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Moravská-Ostrava.** **3.50,** Programme for Children. **4.5,** Gramophone Music. **4.15,** Educational Talk. **4.25,** Gramophone Music. **4.35,** English Lesson. **4.50,** Gramophone Music. **5.5,** Agricultural Report. **5.15,** Talk for Workers. **5.25,** News in German. **5.30,** German Transmission: Talk: Large Cities of Europe—Madrid. **5.50,** Time and News. **5.55,** Talk on the following Transmission. **6.0,** The Queen of Spades—Opera (Tchaikovsky), relayed from the National Theatre. **9.0,** Time and News. **9.15,** German Talk: The Mineral Wealth of Czechoslovakia. **9.30** (approx.), Close Down.

NOV. 6th MONDAY *continued*

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Lausanne**), Gramophone Concert. **12 Noon** (from **Lausanne**), Financial Notes. **12.10 p.m.** (from **Lausanne**), Gramophone Concert. **1.0 to 2.58,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0,** See **Schweizerischer Landessender.** **5.0** (from **Lausanne**), Talk on Metallurgy. **5.30** (from **Lausanne**), Programme for Children. **5.55** (from **Lausanne**), Italian Lesson. **6.20** (from **Lausanne**), Talk. **6.40** (from **Lausanne**), Talk on Swiss Week. **6.59** (from **Lausanne**), Weather Report. **7.0** (from **Lausanne**), An Interview with Clotilde and Alexandre Sakharoff. **7.30** (from **Lausanne**), Song Recital by Christy Solari, accompanied by the Radio-Lausanne Orchestra. **8.30** (from **Lausanne**), Light Music by the Montreux Lyrette, conducted by Held. **9.0,** News and Weather.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**11.0 a.m.,** Weather. **1.15 p.m.,** Variety Programme. **5.0,** Weather. **8.5,** Light Music. **8.30,** Weather. **8.40,** Light Music and Announcements. **9.0,** Chimes and News. **9.30,** Reading. **10.0,** Popular Music by the Station Quartet, with Vocal Solos.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.,** and **2RO, 25.4 metres.**—**12.0 Noon to 1.15 p.m.,** Gramophone Concert of Opera and Variety Music. In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.55,** Giornale Radio and Exchange. **4.10,** Weather. **4.15,** Concert of Chamber Music by Giovanna del Sera (Violin), Romano Rasponi (Baritone), and Elisa Capolino (Soprano); Violin Solos: (a) Andante from the Spanish Symphony (Lalo), (b) Moto perpetuo (Novacek); Baritone Solos: (a) Stornello (Bustini), (b) Canto calabrese (Mario Costa), (c) Aria from Zaza (Leoncavallo); Violin Solos: (a) Poème (Fibich), (b) Ridda dei folletti (Bazzini); Soprano Solos: (a) Aria from The Force of Destiny (Verdi), (b) Song from Il piccolo Marat (Mascagni), (c) Aria from Iris (Mascagni). **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Dopolavoro and Tourist Report. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time and Announcements. **7.15,** Gramophone Music. **7.30,** Giornale Radio and Sports Notes. **7.45,** Programme to be announced. **8.45** (approx.), Concert of Light Music, conducted by Culotta. **10.0,** Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.**—**7.30 p.m.,** Revolving Stage, from **New York.** **8.0,** Health Hunters, Sketch. **8.15 to 8.30** (approx.), Soloist, from **New York.** **12.45 a.m. (Tuesday),** Stock Reports and Police Notices. **1.0,** News of the Day—Poetry, History. **1.30 to 4.0, New York** Relay. **1.30,** Musical Programme. **2.0,** A. and P. Gipsies. **2.30,** Ship of Joy. **3.0,** Contented Programme. Orchestra and Male Quartet. **3.30,** Jules Lande, Troubadour of the Violin. **4.0,** Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **11.0** (from **Basle**), Waltzes on Gramophone Records. **11.29,** Time Signal from Neuchâtel Observatory, Weather, and News. **11.40** (from **Basle**), All over the World—Gramophone Concert. **12.25 p.m.** (from **Basle**), Time, Weather and Exchange. **12.30** (approx.) to **2.30,** Interval. **2.30** (from **Basle**), Song Recital on Gramophone Records. **3.0** (from **Basle**). From the Minuet to the Foxtrot—Musical Programme. **4.0** (from **Basle**), Modern Viennese Music on Gramophone Records. **5.0** (from **Basle**), Programme for Children. **5.30** (from **Zürich**), Talk: Great Swiss Statesmen—General Dufour. **6.0,** Time and Weather. **6.5** (from **Zürich**), Gramophone Music. **6.20** (from **Zürich**), English Lesson. **6.50** (from **Zürich**), Songs to the Lute by Hans Roelli. **8.0,** Weather and News. **8.10** (from **Zürich**), A Beethoven Symphony with Commentary. **9.25** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**4.5 p.m.,** Country Music. **4.45,** Gramophone Music. **5.45,** Elementary German Lesson. **6.15,** Weather and News. **6.30,** Talk: The Origin of the Radio Valve, relayed from **Uppsala, 662 kc/s, 453.1 metres.** **7.0,** Gustavus Adolphus Memorial Programme. Military Band Music, conducted by Grundström, and Choral Music, conducted by Emil Carelius. **8.15,** Reading. **8.45,** Weather and News. **9.0,** Concert by the Göteborg Chamber Orchestra, conducted by Tor Mann. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—No Transmission.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**11.0 a.m.,** Concert by the Station Orchestra, conducted by Otto Seyfert. Soloist: Käthe Ivers (Soprano). **12.15 p.m.,** See **Frankfurt.** **12.25,** Local News and Weather. **12.35 to 1.30,** Concert. Part I—Gramophone Records of the Comedian Harmonists. Part II—Orchestral Music on Gramophone Records: Overture, Romeo and Juliet (Tchaikovsky); Salome's Dance of the Seven Veils (Richard Strauss); Bolero (Ravel). In the interval at **1.0,** To-day's Watchword. **1.40,** German Chamber Music by the Station Quartet: Fantasia in D Minor for Pianoforte (Mozart); String Quartet in C (Mozart). **2.30,** Talk: Saxony. **3.0,** Concert by the Station Orchestra, conducted by Gustav Görlich. In the interval at **4.0,** To-day's Watchword. **5.0,** Gramophone Music and Anecdotes. **5.20,** Germany and Disarmament—Radio Sequence. **5.40,** Time, Agricultural Notes and Weather. **6.0,** Transmission for all German Stations, relayed from **Breslau.** **7.0,** See **Frankfurt.** **9.20,** Topical Talk. **9.30,** Local News, Weather and Sports Notes. **9.45,** Gramophone Music. **10.0,** Concert by the Station Orchestra, conducted by Gustav Görlich: Weidmannsheil-Marsch (Reckling); Waltz: Wine, Woman and Song (Joh. Strauss); Humorous Polka for Piccolo and Bassoon: The Bee and the Bent (Landl); Humorous Dialogue; Local History; Quartet for Wind Instruments (Krüger); March, Die lustigen Isartaler (Leben); A Radio Anecdote (Georg Lorenz); March Potpourri (Komzak). **11.0,** See **Langenberg.** **12 Midnight,** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Light Music. **6.45,** Extracts from Sound Films. **7.0,** Orchestral Music. **7.15,** News. **7.30,** Extracts from Opera: Prayer from Tosca (Puccini), Dances from Lakmé (Delibes), Serenade from The Barber of Seville (Rossini), Aria from Romeo and Juliet (Gounod). **7.45,** Violin Recital: Tambourin chinois (Kreisler); Arlequin (Lalo); Berceuse (Ravel); Melody (Juon). **8.0,** Music by a Viennese Orchestra. **8.15,** Extracts from Operetta: Arias from Azor (Gabaroche), Frasquita (Lehár), Un soir de réveillon (Moretti), and La pouponnière (Verdun). **8.30,** Accordion Music. **8.45,** Chansonnettes. **9.0,** Concert by the Station Orchestra, conducted by Espy: Overture, Les Saltimbanques (Ganne); Suite No. 2 from L'Arlésienne (Bizet); Prelude to L'attaque du Moulin (Bruneau); Nocturne from Cocorico (Ganne); Selection from La Bohême (Puccini); Selection from Phi-Phi (Christine); March of the Toreadors, from Carmen (Bizet). In the interval, Extracts from Opera Arias: Faust (Gounod), The Magic Flute (Mozart), Hamlet (Thomas), and Hérodiade (Massenet). **10.15,** News. **10.30,** Concert for Listeners in Morocco: Duet from Act 4 of Carmen (Bizet); Prayer from Werther (Massenet); Air from Cavalleria rusticana (Mascagni); Per aspera ad astra (Urbach); Condé (Wettge); Aubade indienne (Moret); Parade March (Faust). **11.0,** Popular Music: Meditation from Thaïs (Massenet); Extract from Le Jongleur de Notre Dame (Massenet); Choir, The Blue Danube (Joh. Strauss); Le rêve, from Manon (Massenet). **11.15,** Dance Music. **12 Midnight,** News. **12.5 a.m. (Tuesday),** Vocal Tangos. **12.15,** Orchestral Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332 metres; Genoa, 959 kc/s, 312.8 metres,** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.,** Balalaika Concert relayed from the Cabari di Milano. **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Dopolavoro Notes and Gramophone Music. **6.0,** Time, Tourist Talk and Gramophone Music. **6.10,** Market Prices. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** News. **7.15,** Gramophone Concert. **8.15,** One Act Comedy. **8.45,** Chamber Music Concert. Soloist: Giovanni Chiti (Violin); First Movement from the Kreutzer Sonata (Beethoven); Rêverie (Coppola); Concert Mazurka (Konsthi); Pavane (Couperin-Kreisler); Zingaresca (Sarasate). **9.30,** Gramophone Dance Music. **10.0,** Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m,** Religious Information in Italian **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. **12 Noon,** Time and News. **12.10 p.m.,** Concert (contd.). **2.0,** Time and Market Prices. **2.20,** Talk for Housewives. **2.30,** Programme for Children. **2.55,** Gramophone Concert of French Opera Music: Overture, La Dame blanche (Boieldieu); Alfred Piccaver: Rêverie from Manon (Massenet); Lucrezia Bori: Gavotte from Mignon (Thomas); Heinrich Schlusnus; Valentine's Prayer from Faust (Gounod); The Berlin Opera House Orchestra: Ballet Music from Samson and Delilah (Saint-Saëns); Meta Seinemeyer, Jaro Dworsky and Emanuel List: Finale from Faust (Gounod). **3.30,** Pianoforte Trio in B flat (Mozart). **4.0,** Talk with Illustrations: The Perfect Cadence. **4.25,** Violin and Viola Recital by Heinz Lorentz aud Friedl Haberler-Kaan; La folia (Corelli-Leonard); Fugue (Tartini-Kreisler); Londonderry Air (arr. Kreisler); Zephir (Hubay); Violin Solo, Serenade, Op. 36 (Fleischer); Viola Solos (Wolf): (a) In dem Schatten meiner Locken, (b) Und willst du deinen Liebsten sterben sehen, (c) Denk es, o, Seele, (d) Nimmersatte Liebe, (e) Wer rief dich denn, (f) Er ist's. **5.5,** Theatre Talk. **5.25,** Talk: Literature in connection with the Week's Talks. **5.30,** English Lesson. **6.0,** A-Hunting we will go—Concert by the Stiegler Quintet and the Wiener Symphoniker, conducted by Josef Holzer. In the interval at **6.30,** Time, Weather and Programme Announcements. **7.0,** Topical Talk. **7.15,** Natural History Talk. **7.55,** Schubert—Brahms Concert by the Wiener Symphoniker, conducted by Dr. Anton Webern; Overture, Rosamund (Schubert); German Dances (Schubert-Webern); Serenade in D (Brahms). **9.5,** News. **9.20,** Dance Music by Ferry Hyde and his Band from the Café Palmhof. Soloist: Toni v. Schmid (Songs). After the Programme, Announcements.

WARSAW

POLSKIE RADIO, 212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5,** Songs from Revues on Gramophone Records. **11.30,** Radio Journal. **11.35,** Weather. **11.38,** Violin Concerto in E (Bach), played by Yehudi Menuhin (on Gramophone Records). **12 Noon,** Interval. **2.30,** Economic Notes. **2.40,** Traffic Report. **2.45,** Aviation Report and Anti-Gas Drill. **2.55,** Light Music by the Rachon Orchestra: Selection from The Rose of Stamboul (Fall); Tango (Jaworski); Rustle of Spring (Sinding); Potpourri (Morena); Serenade (Rachmaninov); Hungarian Rhapsody (Liszt); Air (Brodsky); Cavalry March (Rubinstein). **3.40,** Elementary French Lesson. **3.55,** Song Recital by Mme. Lozinska: Arias from André Chenier (Giordano), Iolanthe (Tchaikovsky), and Die tote Stadt (Korngold); Du bist die Ruh (Schubert); Two Songs (Schumann); Air (Rybicki); Love (Niewiadomski). **4.20,** Pianoforte Recital by Roman Micewski: Two Etudes in E flat minor, Op. 10, No. 6, and in E minor, Op. 25, No. 5; Studies in F minor and G sharp minor (Liszt); Reflets dans l'eau (Debussy); Rendez-vous (Godowski); Flammes de mer (Sauer); Butterflies (Rosenthal). **4.50,** Answers to Agricultural Correspondence. **5.0,** Talk on Poland. **5.20,** Operetta Music on Gramophone Records. **6.5,** Miscellaneous Items. **6.25,** Talk: Humour in Chopin's Music, relayed from **Wilno.** **6.40,** Radio Journal. **7.0,** Il Seraglio—Opera in Three Acts (Mozart). In the intervals, Talk and Sports Notes. **10.0,** Aviation Weather Report and Police Notes. **10.5,** Cigány Music relayed from the Maison Foukier.

ZURICH.—See **Schweizerischer Landessender.**

TUESDAY
NOVEMBER THE SEVENTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes, Agricultural Report, and Weather. **7.20,** Opera Music: Arias from Lohengrin (Wagner), I Pagliacci (Leoncavallo), Martha (Flotow), and Samson and Delilah (Saint-Saëns). **7.55,** News. **8.0,** Time and Lottery Results. **8.10,** Chamber Music. Trio, with Pianoforte Accompaniment (Pergolesi); Sonata for Bassoon and Pianoforte (Saint-Saëns). **8.40,** News. **8.45,** Popular Songs. **9.0,** Concert of Oriental Music. In the interval at **9.30,** News. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.0 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.40,** News. **7.0,** Gaelic Reading. **7.15,** Talk by Herbert Hughes: Irish Music in Relation to Modern Life. **7.30,** Time. **7.31,** Symphony Concert, conducted by Vincent O'Brien. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert of Dance Music: Happy as the Day is Long; My Moonlight Madonna; I couldn't tell them what to do; Learn to Croon. **9.45,** Dance Music: Isn't it Heavenly?; Dancing Butterfly; Plegaria Tango; Hello Montreal. **10.0,** Concert by the International Broadcasting Company (Ireland), Ltd.: A Supper with Suppé (arr. Morena); Grand March from Aida (Wagner); Song: O Mistress Mine (Quilter); Ballet Music from Coppélia (Delibes); Voices of Spring (Joh. Strauss); Violin Solo: Serenade to Nicolette (Russell); Barcarolle from The Tales of Hoffmann (Offenbach). **10.30,** Time, News and Weather Report. **10.40,** Irish Music. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Selection from The Flying Dutchman (Wagner); Nocturne (Ganne); Minuet from the Symphony in G minor (Mozart); Melody (Grieg); Canzonetta (d'Ambrosio); Melody (Rachmaninov); Selection from Mirella (Gounod). **7.0,** Request Gramophone Records. **7.30,** Exchange and Talk in Catalan. **8.0,** Gramophone Music and News. **8.15,** Football Notes. **8.30,** Catalan Educational Programme: Geography and History Lesson. After the Programme, Messages to Seamen. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5,** Sponsored Programme. **9.30,** El Romeral—Musical Comedy in Two Acts (Emili Accvedo and Ferrrran Diez Giles). In the interval at **11.0** (approx.), News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Quintet Concert of Light Music. **3.55 to 7.0,** See **Rome.** **7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**5.55 p.m.,** Time and Announcements. **6.0,** Talk. **6.40,** Song Recital by Mme. Melanie Bugarinovic. **7.10,** Radio Play. **7.40,** Symphony No. 6 (Tchaikovsky) on Gramophone Records. **9.10,** Time and News. After the Programme, Relay of Foreign Stations.

BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—3.30 p.m.,** Suite in B, Op. 10, in the form of Variations for Pianoforte (Welter), played by the Composer. **3.55,** Sonata in C minor, Op. 139, for Violin and Pianoforte (Reger), played by Käte Grandt and Helmut Hidegheti. **4.30,** The Day's Watchword. **4.35,** Review of Books on Brahms, Beethoven, and Wagner, with Gramophone Interludes. **5.10,** A Radio Sequence. **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** See **Berlin (Deutschlandsender). 7.15,** Popular Concert: The Station Orchestra, conducted by Georg Vack; Fred Bird-Lehmann's Dance Band; the Station Choir and Quartet, conducted by Heinzkarl Weigel. In the interval at **9.0** (approx.), News and Sports Notes.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**11.5 a.m.,** Gramophone Concert of Choral Music. **11.55,** Time Signal. **12.45 p.m.,** News. **1.0,** Gramophone Concert: Grüss mir mein Hawaii (Kollo); Goodnight, Sweetheart (Noble); Leopold, Leopold, tu' doch nicht so (Meisel); Es summt ein Lied der Samovar (Margulies-Holms); Ich hab so ein Gefühl—als ob (Meisel); Mein Herz sagt leise, ich liebe Dich (Kauler); Ein Lied aus Cuba (Stothart); Ich möcht einmal wieder verliebt sein (Stolz); Du hast das Feuer im Blut (Dazar-Benoit). **1.30,** The Watchword. **1.35,** Gramophone Concert: Es gibt nur eine Liebe (Künnecke); Beim Sonnewirt is a Hochzeit heut (Stauch); Ohne Dich ist die ganze Welt ohne Sonne (Köhler-Arlen); Anita (Meisel); Ich trage Dein Bild stets im Herzen (Kiesow); Veni nella Gondola mia (Raffaelli); Melody of Love (Engel-Berger); Waltz, Barcarolle (Fasola). **2.0,** Programme for Young People. **2.20,** Talk: Strange Animal Friendships. **2.30,** Weather and Exchange. **2.45,** Reading: Der treue Johannes. **3.0,** See **Leipzig. 4.0,** A Worker comes home—a Radio Picture with Music (Bremen and Wulf Bley). **4.20,** Fantasia contrapuntistica for two Pianofortes (Busoni). **5.0,** The Watchword. **5.5,** Variety Programme. **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** Talk: Germany and the League of Nations. **7.10,** See **Leipzig. 9.45,** Weather. **10.0,** News. **10.5** (approx.), Programme from **Langenberg. 11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News and Racing Results. **7.40,** Programme for Women. **7.55,** Lottery Results. **8.0,** Talk on Science. **8.15,** News. **8.30,** See **Paris (Eiffel Tower).**

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**6.0 p.m.,** See **Prague. 7.0,** Jubilee Concert arranged by the Sacred Music Society, relayed from the Redoute Hall. The Bratislavian Symphony Orchestra, Choirs and Soloists. **9.0,** See **Prague. 9.15,** See **Moravská-Ostrava. 10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—12 Noon,** Weather. **12.5 p.m.** (approx.), Gramophone Concert of Light Music. **12.45,** Time. Weather, and News. **1.10,** To-day's Watchword. **1.15,** Contralto Song Recital by Erika Marks: Arietta, Arabiens einsam Kind (Weber); Widmung (Franz); Two Songs (Graener): (a) In Danzig, (b) Wintergang Mein Herz (Courvoisier); Nachruf (Schoeck); **1.40,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices. **2.15,** Reading (Peter Arnolds). **2.30,** Programme for Children. **3.0,** Concert by the Silesian Philharmonic Orchestra, conducted by Wolfgang Friebe: Overture, Phèdre (Massenet); Selection from Andrea Chenier (Giordano); In a Persian Market (Ketelbey); Ballet Suite from Coppélia (Delibes); Dornröschens Brautfahrt (Rhode); Overture, Pique Dame (Suppé). In an interval at **3.45,** To-day's Watchword. **4.30,** Agricultural Prices. **4.35** (approx.), Reading (Franz Spunda). **5.0,** Talk: Germany and the Armament Question. **5.20,** Talk: Luther. **5.50,** Meat Market Prices. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** See **Leipzig.** In an interval at **8.30,** News. **9.40,** Time and News. **10.0,** Political Press Review. **10.20,** Dance and Light Music by the Curt Sparmann Band, relayed from the Kaffee Vaterland. **11.30** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News, Legal Talk and Agricultural Report. **6.0,** See **Prague. 7.0,** Concert by an Orchestra of Unemployed Musicians. Conductor: Suic. March (Siede); Waltz, Donausagen (Fucik); Mattinata (Leoncavallo); Schubert Fantasia (Urbach); Dance of the Dervishes (Bendix); Strauss Operetta Potpourri (Schlögel). **7.40,** See **Prague. 9.15,** See **Moravská-Ostrava. 10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 389 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans. **12.20 p.m.,** Song Recital by Anita Touret: Air from Rinaldo (Handel); Air from Les dragons de Villars (Maillart); Ses pas incertains (De Boeck). **12.35,** Orchestral Concert. **1.0,** Le Journal Parlé. **1.10,** Jazz Music on Gramophone Records. **1.45,** Gramophone Music: Ariette de Cloris (Lully); Plaisir d'amour (Martini). **5.0,** Dance Music by the Radio Orchestra, conducted by Franz André: Polka from Die Fledermaus (Joh. Strauss); Waltz (Métra); Polka Mazurka (Strauss); Waltz, The Blue Danube (Joh. Strauss); Quadrille from Orpheus in the Underworld (Offenbach); Invitation to the Waltz (Weber); The Lancers Quadrille (Métra); Gallop, Tic-Tac (Joh. Strauss). **5.30,** Programme for Children. **6.5,** Literary Review. **6.15,** Divertissement (Tansman), by the Belgian Pianoforte Quartet. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans. **7.15,** Film Review. **7.30,** Talk for Women and Art Notes. **8.0,** Concert by the Radio Orchestra, conducted by André. Soloist: Marthe Darney (Songs). Part I—Belgian Music. Danseries de Gervaise (Souris); Nocturne (Brenta); Choral and March (Souris); Les danseuses de Kerlouan (Daneau); Rondo (Poot). **8.45,** Talk: Reforming the State. **9.0,** Orchestral Concert (contd.). Part II—Overture, La Juive (Halévy); Aria from L'Africaine (Meyerbeer); March from The Prophet (Meyerbeer); Aria and Piece from Sigurd (Reyer); March from Aida (Verdi). **9.45,** Song Recital by Marthe Darney: La Procession (Franck); Chanson triste (Duparc); Si mes vers avaient des ailes (Hahn). **9.55,** Christus Vincit (Liszt). **10.0,** Le Journal Parlé.

LISTEN, BOYS! A famous weekly feature at the Berne studio, relayed by Beromunster, is the "Boys' Circle." Here is a typical group. One of their number is seen addressing the microphone.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish. **12 Noon,** Gramophone Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans. **5.0,** Gramophone Concert of Italian Opera Music. **5.45,** Programme for Children. **6.30,** Gramophone Concert. **7.0,** Gramophone Music. **7.15,** Dialogue: The Great Anti-Fascist Demonstration at Malmedy. **7.30,** Tourist Talk. **8.0,** Concert by the Station Symphony Orchestra, conducted by Meulemans; Mazeppa (Liszt); Le chasseur maudit (Franck); Tone Poem, Tamara (Balakirev); A Night on the Bare Mountain (Mussorgsky); L'apprenti sorcier (Dukas); The Ride of the Valkyries (Wagner). In the interval, Talk: The Intelligentsia and the Social Struggle of Socialism. **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**11.0 a.m.,** Exchange, Market Prices and Gramophone Music. **12 Noon,** Radio Journal. **12.15 p.m.,** Light Music on Gramophone Records. **4.0,** Variety Music by the Ionesco Orchestra. In the interval, Radio Journal. **6.0,** Educational Programme. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Song Recital by Maxim Vasiliu: Aria from La Bohème (Puccini); Tom der Reimer (Loewe); La Gondola nera (Rotoli); The Gipsy (Olteanu); Song (Anastasesco). **7.20,** Concert by the Station Orchestra, conducted by Rogalski: Symphonic Poem, At the Monastery (Teodosiu); Pianoforte Concerto No. 2 (Romanov), with the Composer at the Pianoforte; Symphonic Piece (Singer); Symphonic Episode (Enacovici); Symphonic Allegro (Chiresco). In the interval at **8.0,** Talk for Listeners in Foreign Countries. **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **6.30 p.m.** till Close Down.—**4.0 p.m.,** Talk. **4.30,** Pianoforte Recital by Eugon Zeitinger. Ten Variations on Como un angelo (Mozart); Two Songs (Schumann); Dance (Debussy); Berceuse (Chopin); Etude in C Minor (Chopin). **5.0,** French Lesson. **5.30,** Concert by the Bura Cigány Band. **6.30,** Carmen—Opera in Four Acts (Bizet), relayed from the Opera House. After the Opera, Music by the Roosz Orchestra, relayed from the New York Café. In the interval from **10.0 to 10.20,** Talk in Italian.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY, 31.51 metres.—11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.2,** Concert by the Leonard Gyldmark String Ensemble, relayed from the Bellevue Strandhotel. **1.0,** Interval. **2.0,** Concert by Carl Rydahl's Instrumental Ensemble. Soloist: Tscherning Möller (Songs). Overture, Le maçon (Auber); Suite, Petites musiques (Florent Schmitt); Menuetto (Simonetti); Abendlied (Schumann); Polonaise (Schubert); Six Songs (Gyldmark); Selection from Monsieur Beaucaire (Messager); Waltz (Sinding); Koketteri (Gregh); Ségovia (Roussel); Waltz, Rendez-vous (Rosey); Dornröschens Brautfahrt (Rhode); Tarantella from Napoli (Paulli). **4.0,** Programme for Children. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk. **5.15,** Elementary German Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk. **7.0,** Time Signal from the Town Hall. **7.1,** Orchestral Concert, relayed from the Odd Fellows' Hall. Conductor: Sir Henry Wood. Soloist: Johanne Stockmarr. (Pianoforte). Suite (Purcell); Pianoforte Concerto in A minor, Op. 54 (Schumann). **8.35,** Tre Festaftener—Radio Play in Five Acts (Georg Adtrofte). **9.0,** News. **9.15,** Gramophone Concert of Italian Opera Music. **9.35,** Zither Recital by Hermann Gernert. **9.55,** Dance Music by the Richard Johansen Band, relayed from the Lodberg Restaurant. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**6.5 p.m.,** Technical Correspondence. **6.20,** Miscellaneous Announcements. **6.25,** See **Warsaw. 6.40,** Programme Announcements. **6.45,** See **Warsaw. 9.0,** Sports Notes. **9.10,** See **Warsaw. 10.30** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I—Military Music. Signature Tune; March, Light of Foot (Latann); The Teddy Bears' Picnic (Bratton); Berceuse (Lacôme); The Hunt in the Black Forest (Voelker); Down South (Myddleton); Jolly Fellows (Vollstedt); In a Clock Store (Orth); Selection from The Belle of New York (Kerker). Part II—Dance Music. It's not a Secret any more (Blue); Isn't it Heavenly? (Hamburg); Tango, Nunca (Pesenti); 'Twixt the Devil and the Deep Blue Sea (Eyton); My Moonlight Madonna (Fibich); Happy Ending (Parr-Davies); Let's make up (Little); Sing another Line (Carson); Signature Tune. **12 Noon to 4.30 p.m.,** Programme in French. **4.30 to 6.0,** Programme in English by the I.B.C. **4.30,** The I.B.C. Nursery Corner. **5.0,** Orchestral Concert for Torquay and Exeter: Signature Tune, The Night by the Sea; Waldteufel Memories (arr. Finck); The Child from Alsace (Lehár); 'Cello Solo: Abendlied (Schumann); The Blackbird in the Apple Tree (Coates); Pan and the Wood Goblins (Rathke): Violin Solo: Hungarian Dance No. 5 in G minor (Brahms); Selection from He wanted Adventure (Waller); The Clatter of the Clogs (Flynn). **5.30,** Mandoline Recital for Plymouth and Devonport: The Blue Danube

NOV. 7th TUESDAY *continued*

(Strauss); Czardas (Monti); Tesoro mio (Beccucci); Mandolinata (de Pietro); Signature Tune. **5.45,** Dance Music: My Own; The Wedding of Mr. Mickey Mouse; Solitario; I've found the Right Girl. **6.0 to 10.0,** Programme in French. **10.0** till Close Down, Programme in English by the I.B.C. **10.0,** Dance Music: Signature Tune, Bells of Normandy; I'll show you off; The Selection from College Humour; Cecilia Mia; Whistling under the Moon; It's the talk of the Town; Sweetheart Darlin'; Egypt; Lover; Oh, Johanna; Dinner at Eight; Mi amor esta en el Valle; Stay out of my Dreams; Morning, Noon and Night; Lazybones; The Last Round Up; Happy Ending; Signature Tune. **11.0,** Concert of Light Music: Parade of the Tin Soldiers (Jessel); It's not a Secret any more (Blue); Ca c'est Paree (Padilla); Selection from The Pirates of Penzance (Sullivan); Wood Nymphs (Coates); A Life on the Ocean (Binding); Isn't this a Night for Love? (Burton); March, The Standard of St. George (Alford). **11.30,** Concert by the I.B.C. (Ireland), Ltd: Signature Tune, Come back to Erin; March, La Czarine (Gaune); Animal Antics (Wark); Selection from The Chocolate Soldier (O. Straus); Pianoforte Duet, Who do you think you are? (Heymann); The Mountains of Mourne (French); Dreams on the Ocean (Gung'l); Amina (Lincke); Love and Life in Vienna (Penard); Signature Tune, Come back to Erin. **12.5 a.m. (Wednesday),** I.B.C. Late News Bulletin in English. **12.10** (approx.), Club Concert for Fairlie and Largs Listeners: Signature Tune, The Chum Song; I lost my Girl from Memphis; 'Leven thirty Saturday Night; I'm yours; The Moon is Low; Get Happy; Shadows on the Swanee; Don't blame me; Sing another Line; Mademoiselle; Trouble in Paradise; Solitario; Tick Tock; Mary Rose; Signature Tune. **1.0,** Dance Music: Signature Tune, The Bells of Normandy; Happy as the day is long; My Moonlight Madonna; Let's make up; Isn't this a Night for Love; Sundown in a little Green Hollow; Isn't it Heavenly; Learn to Croon; What a perfect Combination; There's a Cabin in the Pines; Lou'siana Lullaby; At the Old Pig and Whistle; A Girl like Nina; Sweet Dreams Pretty Lady; Avalon; Sentimental Gentleman from Georgia; Ding, Dong, Ding; Signature Tune. **2.0,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** Programme from **Langenberg. 1.30,** Local News. **1.40,** Talk for the Housewife. **2.30,** Weather. **2.40,** Time and Exchange. **3.0,** See **Langenberg. 5.0,** Gramophone Music. **5.50,** Weather, News, Exchange and Programme Announcements. **6.0,** Transmission for all German Stations (relayed from **Hamburg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** See **Stuttgart. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News and Weather. **9.40,** See **Langenberg. 11.0,** Extracts from Weihe der Kraft (Energy Consecrated) — a Luther Drama (Zacharias Werner). **12 Midnight,** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m.,** Transmission for all German Stations. Brahms Concert by the Small Station Orchestra and the Station Choir, conducted by Gerhard Maasz. Soloists: Erna Kroll-Lange, Erna Homann, Otto Stadelmaier and Bernhard Jakschtat (Songs), Bernhard Hamann (Violin), Richard Gräfe (Clarinet), Albert Döscher (Horn), Gerhard Gregor and Gerhard Maasz Pianoforte). **7.0,** See **Berlin (Deutschlandsender), 7.10** (from **Hanover**). The Waltz—the Polka and the Czardas. Concert by the Hanover Station Orchestra, conducted by Otto Ebel von Sosen. **8.15** (from **Flensburg**). The Joys and Sorrows of Love—Concert relayed from St. Nicholas Church, Flensburg. The Flensburg Small Choir, with Gertrud Trenktrog (Harpsichord). Das Beste (Melchoir Frank); All Augenblick (Brechtl); Eu'r schön Gestalt (Harnisch); Suite for Harpsichord: Auf die Mayerin (Froberger); Mein' Treu' und Lieb (Harnisch); Liebesleid (Hausmann); Bös Weib—ein Kreuz (Dedekind); Pieces for Harpsichord: (a) Air (Muffat), (b) Presto (Böhm), (c) Courante (Muffat), (d) Allegro spirituoso; Der beste Schütz' (Harnisch); Freundlich von Art (Brechtl); Ich sing' und spring'; Der Hageatolz (Dedekind); Mit Lust (Frideric). **9.0,** News. **9.20,** Concert by the Station Orchestra, conducted by Otto Petersen, Max Krolin and Erwin Clarmann: Overture, Semiramis (Rossini); Ballet Music from Rosamunde (Schubert); Polonaise in E (Weber); Overture, Der Opernball (Heuberger); Arab Dance (Grieg); Hommage March (Grieg); March from Aida (Verdi); Procession to the Minster from Lohengrin (Wagner); Dance Suite from The Bartered Bride (Smetana); Waltz, Hoch lebe der Tanz (Waldteufel); Overture, Paragraph 3 (Suppé); March from The Gipsy Baron (Joh. Strauss); Selection from The Land of Smiles (Lehár).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert. In the intervals at **12.20** and **1.0,** News. **1.30,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Market Prices. **2.30,** Programme for Children. **2.55,** Talk. **3.0,** Orchestral Concert, conducted by Otto Siebert: Concerto for Strings (Pergolesi); Motet: Exultate Jubilate—for Soprano and Orchestra (Mozart); Symphony in D—The Clock (Haydn); Andante, Minuet and Rondo from the Haffner Serenade (Mozart). In the interval at **3.50,** Talk: What can we German Women do for our Nation? **4.30,** A Radio Sequence. **4.50,** Reading from the Works of Fritz Reuter. **5.15,** Agricultural Notes. **5.20,** Talk. **5.25,** Concert of Old Music by the Freiburg Chamber Trio: Kreuzerfahrlied (Vogelweide); Wach auf mein Hort (von Wolkenstein); Der lenze gut (Quienfurt); Ein vreulein edel von naturen (from the Lochheim Liederbuch); Vor alln ich krön (Voit); Mag ich Unglück mit wiederstan (Senft); Klaglied (Seufl); Die Brünnlein, die da fliessen (Isaak); Ei dufeiner Reiter (Scheidt). **5.55,** Weather. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** See **Berlin (Deutschlandsender). 7.15,** The Merry Wives of Windsor—Opera (Nicolai). News in the interval. **9.15,** News and Weather.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.** Programme of the General Broadcasting Society (A.V.R.O.).—**11.10 a.m.,** Pianoforte Recital by Julius Hijman. Inaugural Sonata (Schäfer); Twilight (Diepenbrock); Rondo, Op. 16 (Chopin). **11.40,** Time Signal. **11.41,** Concert by Otto Hendrik's Orchestra. In the intervals, Gramophone Records. **1.55,** Interval. **2.10,** Gramophone Records. **2.40,** Dressmaking Lesson. **3.40,** Violin Recital by Max Groen. **4.10,** Concert by a Children's Choir, conducted by Jacob Hamel. **4.40,** Programme for Children. **5.10,** Talk. **5.40,** Concert of Light Music relayed from the Haeck Restaurant, The Hague. **6.40,** Talk: A New Tax. **7.5,** Gramophone Records. **7.10,** English Lesson. **7.40,** Time Signal. **7.41,** News. **7.45,** Concert by the Station Orchestra, conducted by Nico Gerharz. **9.40,** Act I of Cæsar and Cleopatra—Historical Play in Five Acts translated by Vogt (Bernard Shaw). **10.15,** Concert by the Station Orchestra, conducted by Nico Gerharz. March-Intermezzo, Blumenkorso (Siede); Waltz, Les Sirènes (Waldteufel); Geschichten von Strauss (Korngold). **10.40,** News. **10.50,** Gramophone Music. **11.40,** Time and Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.**—Programme of the Catholic Radio Society (K.R.O.). **12.40 p.m.,** Concert by the K.R.O. Sextet. **1.40,** Programme for Women. **2.40,** Concert by the K.R.O. Orchestra, conducted by Gerritsen. Overture, The Water Carrier (Cherubini); Concerto grosso in G, Op. 6, No. 1 (Handel); Ballet Music from Prometheus (Beethoven). **3.25,** Contralto Song Recital by Annie v.d. Linden. Selection from Rinaldo (Handel); Aria from Samson and Delilah (Saint-Saëns); Caro mio ben (Franken). **3.40,** Interval. **3.55,** Orchestral Concert (contd.). Prélude de la demoiselle élue (Debussy); Scènes pittoresques (Massenet); Selection from Manon Lescaut (Puccini); España (Chabrier). **4.40,** Song Recital (contd.). Four Songs (Schubert): (a) Du bist die Ruh', (b) Der Tod und das Mädchen, (c) Litanei, (d) Frühlingstraum. **4.55,** Orchestral Concert (contd.). Selection from Der Freischütz (Weber). **5.10,** Gramophone Music. **6.20,** Esperanto Lesson. **6.40,** Police Report. **6.55,** Talk. **7.25,** Talk for Schools. **7.40,** Concert by the K.R.O. Boys. In the interval at **8.10,** News. **8.30,** Gramophone Music. **8.40,** Concert by the Maastricht Municipal Orchestra, conducted by Herman. Soloist: Driessen (Organ); Alborado del grazioso (Ravel); Organ Concerto, Op. 40, No. 2 (Hindemith); Second Suite (Otterloo). **9.30,** Recitations. **9.50,** Gramophone Music. **10.10,** News. **10.15,** Concert by the K.R.O. Boys, conducted by Lustenhouwer. **10.55,** Gramophone Music. **11.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results and News. **8.5,** Agricultural Report. **8.10,** English Lesson. **8.25,** Radio Concert. **9.0,** Report of the First Draw of the State Lottery.

KALUNDBORG.—See **Copenhagen.**

KATOWICE

734 kc/s, 408 metres; 16 kW.—**6.10 p.m.,** Talk. **6.25** till Close Down, See **Warsaw.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by **Helsinki, 815 kc/s, 368.1 metres.—4.0 p.m.,** Popular Music by the Mickey-Mouse Orchestra. **4.25,** Talk. **5.15,** Song Recital by Yrjö Saramo. **5.40,** Talk. **6.5,** Programme by Elsa Hästesko-Heporanta. **6.30,** Concert by the Station Orchestra, conducted by Toivo Haapanen. Soloist: Märtha Fogelholm-Peppink (Violin): Overture, A Midsummer Night's Dream (Mendelssohn); Andante religioso (Klose); Violin Concerto in D (Mozart); Irish Song (Grainger); Melodies (Ranta); Tango (Raitio). **7.45,** News in Finnish. **8.0,** News in Swedish.

LANGENBERG

645 kc/s, 473 metres; 60 kW.—**1.30 p.m.,** Request Items by the Fröhliche Fünf. **1.50,** Programme for Mothers. **2.30,** Exchange. **2.50,** Political Announcements. **3.0,** Concert by the Station Quintet and the Wireless Choir, conducted by Breuer. **5.0,** See **Frankfurt. 5.50,** News. **6.0,** Transmission for all German Stations relayed from **Hamburg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** See **Stuttgart. 9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News, Weather and Sports Notes. **9.40,** Interlude on Gramophone Records. **10.0,** Dance Music on Gramophone Records. **11.0,** See **Frankfurt. 12 Midnight,** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s 319 metres.—11.0 a.m.,** Concert Relay. **12.15 p.m.,** News. **12.30,** Love Songs and Arias on Gramophone Records. **1.15,** News. **1.30,** Young Artists before the Microphone: Soprano and Pianoforte Recital. **2.0,** Reading of Lyrics. **2.10,** Radio Sequence. **2.30,** The Watchword. **2.35,** Exchange. **3.0,** Concert by the Station Orchestra, conducted by Theodor Blumer: Overture, Don Giovanni (Mozart); Selection from Il re (Giordano); Hungarian Suite, Op. 16 (Hoffmann); Ballet Music from Rosamund (Schubert); Ein Märchen (Nicodé); Five Pieces for Orchestra (Wennig): (a) Sei gegrüsst deutsche Heimat, (b) Romance, (c) Wiegenlied, (d) Scherzom, (e) Jubelnde Liebe; Movements from the Petite Suite (Debussy). **4.30,** Books we are waiting for—Reading from Führung and Beleit (Hans Carossa). **5.0,** Favourite Overtures on Gramophone Records. **5.40,** The Watchword. **5.45,** Exchange. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** Carmen—Opera in Four Acts (Bizet). **9.40,** News and Sports Notes. **10.0** (approx.), From A to Z—Gramophone Concert. **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.,** Programme for Children. **5.30,** Gramophone Music. **6.0,** French Lesson. **6.30,** Talk. **7.0,** Music Lesson. **7.45,** Orchestral Concert. In the interval at **8.30,** Weather and News. **9.30** till Close Down, Programme in English by the I.B.C. **9.30,** International Broadcasting Club Concert. Selection from The Count of Luxembourg; Accordion Band: (a) Flower of Spain, (b) Ziganette; Monologue: In Charge of a Book Stall; The Windmill Waltz; The Village Band; In Santa Lucia; Rosa Mia; Trio: (a) Come along with me, (b) Coming round the Mountain; She was only a Postmaster's Daughter; Drink up; Ooh! that Kiss; My Donna Rita. **10.0** (approx.), Close Down.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW. Belgian Evening.—**7.0 p.m.,** Gramophone Records. **7.50,** Concert by the Station Orchestra, conducted by Pensis: Pianoforte Concerto in A minor (Grieg); Mozartiana (Tchaikovsky). **8.50,** News in French. **9.0,** Concert of Belgian Music by the Station Orchestra: Esquisses flamandes (Brusselmanns); Page nostalgique (De Sutter); Interlude (Vreuls); Elegy for Violin (Delcroix); Pensée d'automne (Jongen); Second Suite (De Taeye). **9.45,** News in German. **9.55,** Gramophone Music. **10.15,** Dance Music on Gramophone Records.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.15 p.m.,** Announcements and Exchange. **6.25,** See **Warsaw. 6.40,** Programme Announcements. **6.45,** See **Warsaw. 10.5,** Gramophone Music. **10.30** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW. **7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** The Seasons—Oratorio (Haydn), relayed from **Paris (Eiffel Tower).** After the Relay, News Bulletin.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12 Midnight** till Close Down, Programme in English by the I.B.C.: Concert of Light Music: Black-eyed Susan Brown (Hoffmann); Bananas (Whitcup); Arrogancia Andaluza (Bruguera); Waltz, The Blue Danube (Joh. Strauss); I love you (Canaro); Whistle and blow your blues away (Young); All through the Night (York). **12.30 a.m. (Wednesday),** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Radio Journal and Request Gramophone Records. **7.30,** Talk by Joaquin España Cantos and Gramophone Records (contd.). **8.15,** Topical Review. **8.30 to 9.15,** Interval. **9.15,** English Lesson. **9.30,** Chimes, Time and Topical Review. **9.45** (approx.), A Musical Comedy. **11.45,** Topical Review. **12 Midnight,** Chimes. **1.0 a.m. (Wednesday)** till Close Down, Programme in English by the I.B.C. Dance Music; Hold your Man; I bring a Song; My Moonlight Madonna; You're an Old Smoothie; Medley of British Songs; I'll take an Option on you; Aloha Oe! Le rève passe; Egypt; Let's make it up; The Old Spotted Cow; Lou'siana Lullaby; Trouble in Paradise; Song of the Tramp; Let the World go drifting by; Ding Dong, Ding. **2.0,** I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**6.0 p.m.,** See **Prague. 7.0,** Concert by the Station Orchestra. **7.40,** See **Prague. 9.15,** Concert of Light Music by the Station Orchestra, conducted by Musil. **10.0** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.—10.45 a.m.,** Weather. **1.45 p.m.,** Weather. **3.0,** Dance Music. **8.0,** News. **8.30,** Topical Talk. **8.55,** Chimes. **9.0,** Dance Music. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by **Augsburg** and **Kaiserslautern, 563 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.,** Orchestral Concert conducted by Erich Kloss. **4.40,** Dialogue: An Escape from Siberia. **5.0,** The Watchword. **5.5,** Schumann Recital. Marya Neitzel (Mezzo-Soprano), Ida Hauck and Margot Schmitt (Pianoforte). **5.25,** A Radio Sequence. **5.45,** Time, Weather and Market Prices. **6.0,** Transmission for all German Stations relayed from **Hamburg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** See **Leipzig. 9.45,** Time and News.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres;** and **Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy, LCL.—4.0 p.m.,** Orchestral Concert, relayed from the Grand Hotel. **5.0,** Programme for Women. **5.45,** Accordion Solos. **6.0,** Announcements, Weather and News. **6.30,** English Lesson. **7.0,** Time Signal. **7.1,** Concert by the Station Orchestra, conducted by Kramm. **8.10,** Jonas Lie Programme, arranged by the P.E.N. Club. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Concert by the Minsas Orchestra, relayed by the Britannia Hotel, Trondheim. **9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 18 kW. Time Signal (on **2,680 metres**) at **9.28 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,**

Le Journal Parlé. 8.30, The Seasons—Oratorio in Four Parts (Haydn), relayed from the Conservatoire.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Music. 7.5, Sponsored Programme. 7.15, Le Journal Parlé. 7.30, Sponsored Gramophone Concert. 8.0, Legal Talk. 8.5, Film Review. 8.35, Concert by the Station Orchestra, conducted by Théodore Mathieu. Soloist: Georges Jouatte (Songs). Faust-Symphonie (Liszt); Song, Asie from Scheherazade (Ravel); Antar (Rimsky-Korsakov). 10.30, News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (contd.). 7.45, Gramophone Records. 8.0, Press Review and Weather. 12 Noon, Gramophone Music: Selection from Romeo and Juliet (Berlioz); Waltz from Faust (Gounod); Norwegian Rhapsody (Lalo); Phaeton (Saint-Saëns); Ballet Music from Sylvia (Delibes); Extracts from the Roma Suite (Bizet); Joyeuse marche (Chabrier); Scènes pittoresques (Massenet); Overture and Gavotte from Masques et bergamasques (Fauré); Lanterne magique (Godard); Le camp de Wallenstein (Vincent d'Indy); Ballet Music from Les deux pigeons (Messager); Entr'acte from Messidor (Bruneau); Prélude à l'après-midi d'un faune (Debussy). In the interval at 1.0 p.m., Exchange, News and Weather, and at 1.30, Exchange. 2.0, Exchange and Announcements. 3.0, Lottery Results. 3.45, Exchange and Market Prices. 5.0, Elementary English Lesson. 5.20, Interval. 6.20, Agricultural Talk. 6.45, German Lesson. 7.0, Art Notes. 7.20, Gramophone Music. 7.30, Popular Melodies: Le roi de la montagne (Janin); Song of the Nile (Meyer); Si c'était vrai (Joussain); Personne ne vous aime comme moi (Robert and Jurman); Rose d'Asie (Paddy). 7.45, Review of the Anglo-Saxon Press, Commercial Notes and News. 8.0, Gramophone Music: Selection from Die Zwillingsbrüder (Schubert) and Così fan tutte (Mozart). 8.15, Review by Pierre Scize. 8.30, See **Paris (Eiffel Tower).** In the interval at 9.15, Press Review.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—7.0 p.m., Musical Originalities, from **New York.** 7.30, KDKA Home Forum. 8.0, Programme to be announced. 8.15, Words and Music, from **New York.** 8.45, Congress of Clubs. 9.0, Betty and Bob, from **New York.** 9.15, Meredith Wilson's Orchestra, from **New York.** 9.30, News and Markets. 9.45, Talk, from **New York.** 10.0, Programme to be announced. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from **New York.** 10.45, Orphan Annie, from **New York.** 11.0, News; Pat Haley. 11.15, Sports; Programme Review. 11.30, Evensong. 11.45, Lowell Thomas, from **New York.** 12 Midnight, Amos 'n' Andy, from **New York.** 12.15 a.m. **(Wednesday),** Marvellous Melodies. 12.30, Lois Millier, Organist. 12.45 to 2.30, **New York** Relay. 12.45, Carney's Dog Stories. 1.0, Crime Clues. 1.30, Adventures in Health. 1.45, Trade and Mark. 2.0, Musical Memories. 2.30, Programme to be announced. 3.0, Ortiz Tirado, from **New York.**

PORSGRUND.—See **Oslo.**

POZNAN

POLSKIE RADIO, 897 kc/s, 334.4 metres; 1.5 kW.—6.5 p.m., Miscellaneous Items. 6.25, See **Warsaw.** 6.40, Programme Announcements. 6.45, See **Warsaw.** 9.0, Time and Sports Notes 9.10, Dance Music from the Esplanade Café. In the interval at 10.0, Aviation Weather Report and Police Notes, relayed from **Warsaw.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Parik. 3.50, Programme for Children. 4.15, Talk on Economics. 4.25, Gramophone Music. 4.35, German Lesson. 4.50, Gramophone Music. 5.5, Market Prices. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Talks. 6.0, Time and News. 6.10, Sometimes Maybe—Radio Sketch (Lampel), read by the Author. 6.40, Programme to be announced. 7.0, Concert by the Odkolek Band. 7.40, Songs of Montenegro—Recital by Anton Becvarova. 8.0, The White Mountain—Historical Play (Vrabsky), with Music of the Period. 9.0, Time and News. 9.15, Pianoforte Recital of English Music by Margaret Noskova: The Carmen's Whistle (Byrde); The King's Hunting Jig (Bull); Ground (Purcell); Masks (Bliss); Slow Dance (Howells). 9.40 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—6.0 to 6.15 a.m. (from **Lausanne**), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from **Lausanne**), Gramophone Concert. 12 Noon (from **Lausanne**), Financial Notes. 12.10 p.m. (from **Lausanne**), Gramophone Concert. 1.0 to 2.58, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0 (from **Lausanne**), Concert by the Station Orchestra. 5.0 (from

NOV. 7th TUESDAY *continued*

Lausanne), Programme for Women. 5.30 (from **Lausanne**), Talk. 5.55 (from **Lausanne**), German Lesson. 6.20 (from **Lausanne**), Talk: Crooks and the Law in Literature and Drama. 6.45 (from **Lausanne**), Radio Chronicle. 6.59 (from **Lausanne**), Weather Report. 7.0 (from **Lausanne**), Song, Violin, and Pianoforte Recital by Greta Rumbelz-Trokay (Songs). Simone Beck (Violin), and Sidney Sauvageat (Pianoforte): Vague luci (Caldara); Distella infesta (Aldovrandini); Violin and Pianoforte Duets: (a) Humoresque (Tchaikovsky), (b) Berceuse, (c) Prelude and Dance from The Fire Bird (Stravinsky); Song, Crépuscule (Sokolow); Les larmes; Prelude (Opienski). 8.25 (from **Lausanne**), Les fourberies de Scapin—Comedy in Three Acts (Molière). 9.0, News and Weather. 9.15 (from **Lausanne**), Dance Music. 10.0 (approx.), Close Down.

REYKJAVIK

1,200 metres; 21 kW.—11.0 a.m., Weather. 1.15 p.m., Concert. 5.0, Weather. 8.5, Light Music. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes and News. 9.30, Reading. 10.0, Pianoforte Recital by Emil Thoroddsen, followed by Arias on Gramophone Records.

RIGA

571 kc/s, 525.3 metres; 15 kW.—6.5 p.m., Light Music. 6.30, Humorous Programme. 7.0, News. 7.20, Kreiserleriana for Pianoforte (Schumann), by Vina Berlins. 8.0, Weather and News. 8.15, Concert of Popular Music. 9.15 (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from 7.45 p.m., and **2RO, 25.4 metres.**—12.0 **Noon to 1.15 p.m.,** Trio Concert from **Turin.** In the intervals from 12.30 to 12.45, Giornale Radio and Exchange, and at 1.0, Time and Announcements. 3.30, Programme for Children. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15 to 5.0, Orchestral Concert. 5.40 **(Naples),** Shipping and Sports Notes. 5.45, Morse Lesson and Dopolavoro Notes. 6.0, Tourist Report. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Request Music. 7.30, Sports Notes. Variety Programme, Part I. 7.45, Violin Recital by Arrigo Serato. Sonata for Violin and Pianoforte, Op. 30, No. 7 (Beethoven); Adagio ma non troppo for Violin and Pianoforte (Max Bruch); Sonata for Violin and Pianoforte (Pizzetti). Part II. In the Lift—Comedy in One Act (Duvernois). Part III. Gramophone Music: Fantasia and Fugue (Bach-Elgar); Nocturne in B Flat (Martucci); Fêtes from Nocturnes (Debussy); Valse triste (Sibelius); Two Old Italian Dances (Respighi): (a) Bergamasca, (b) Danza rustica; Prelude and Death of Isolde from Tristan und Isolde (Wagner); March and Scherzo (Prokofiev). 10.0, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.**—12.45 **a.m. (Wednesday),** Stock Reports. 1.0 to 3.45, **New York** Relay. 1.0, Popular Programme. 1.30, Wayne King's Orchestra. 2.0, Ben Bernie's Orchestra. 2.30, Fire Chief Programme. 3.0, Lives at Stake—Dramatic Sketch. 3.30, Madame Sylvia of Hollywood. 3.45, Lady Fingers, Pianists. 4.0, Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—5.50 to 6.5 a.m. (from **Berne**), Gymnastics. 11.0 (from **Zürich**), Notes for Housewives. 11.5 (from **Zürich**), Light Orchestral Concert. 12.25 p.m. (from **Zürich**), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from **Zürich**), Concert by the Small Station Orchestra, conducted by Scherbaum. 3.0, See **Radio-Suisse Romande.** 5.0 (from **Berne**), Light Music on Gramophone Records. 5.30, Medical Talk. 6.0 (from **Berne**), Time, Weather and Notes on the Broadcast for Schools. 6.10 (from **Berne**), Talk: Sunday Excursions. 6.20 (from **Berne**), Legends of other Lands—China. 6.50 (from **Berne**), Introductory Talk to the following Transmission. 7.0 (from **Berne**). Symphony Concert. 9.0 (approx.), Weather and News. 9.10 (approx.), Talk in English: New Travel Facilities in Switzerland. 9.20 (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—1.45 to 2.10 p.m., Broadcast for Schools, relayed from **Malmö, 1,301 kc/s, 231 metres.** 4.5 p.m., Popular Songs. 4.25, Programme for Children. 4.45, Gramophone Music. 5.45, Elementary French Lesson. 6.15, Weather and News. 6.30, Talk: Swedish Village Life. 7.0, Concert by the Radio Orchestra, conducted by Nils Grevillius. 8.15, Literary Review, relayed from **Malmö.** 8.45, Weather and News. 9.0, Concert of Light Music by the Jean Naumanns Orchestra, relayed from **Malmö:** Festival Overture (Flotow); Waltz, Sphärenklänge (Joseph Strauss); Suite (Knümann); Romance (Tchaikovsky); Selection from The Dollar Princess (Fall); Soldierman Potpourri (arr. Rudolf). 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Light Music on Gramophone Records. 12 **Noon,** Orchestral Concert, conducted by Maurice de Villers. In the interval at 12.45 p.m., News, and at 1.0, Time and Exchange. 2.0, Interval. 4.45, Talk on French Colonies: The Lake Chad Region. 5.0, Orchestral Concert, conducted by Roskam: March Intermezzo (Rust); Waltz from Die geschiedene Frau (Fall); Violin Solo: Barcarolle (Dumas); Overture, The Caliph of Bagdad (Boieldieu); Selection from La Favorita (Donizetti); Intermezzo (Kalkman); Minuet (Paderevsky); Spanish Dances Nos. 2 and 5 (Moszkowsky). 6.0, Talk: Kingsley Porter's Works on Roman and Gothic Art. 6.15, Topical Talk. 6.30, Orchestral Concert, conducted by Maurice de Villers: Prelude to Loreley (Bruch); Selection from Manon Lescaut (Puccini); Promenade sous bois (Lacombe); Orchestral Suite, On the Volga (Dyck); Prelude and Clair de lune from Werther (Massenet); Kosuth-Czardas (Michiels). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German. Lottery Results and Announcements. 8.30, Gramophone Music. 8.50, Press Review. 9.0, Radio Report of the First Draw of the State Lottery, relayed from **Paris.** 11.30 (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—11.0 a.m., Gramophone Concert. 11.55, Talk: Christianity in the Twentieth Century. 12.15 p.m., See **Frankfurt.** 12.25, Local News and Weather. 12.35, Programme from **Langenberg.** 1.30, Talk on Flowers. 2.10, Report from the Teachers' Training College at Nagold. 3.0, See **Langerberg.** In the interval at 4.0, To-day's Watchword. 5.0, See **Frankfurt.** 5.50, Time, Agricultural Prices and Weather. 6.0, Transmission for all German Stations, relayed from **Hamburg.** 7.0, See **Berlin (Deutschlandsender).** 7.10, Am laufenden Band—a Musical Potpourri by the Station Orchestra, conducted by Gustav Görlich and Otto Seyfert. 9.0, See **Frankfurt.** 9.20, Topical Talk. 9.30, Local News, Weather and Sports Notes. 9.40 to 11.0, See **Langenberg.** 11.0, See **Frankfurt.** 12 Midnight, Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Music by a Viennese Orchestra. 6.30, Light Music. 6.45, Military Music. 7.0, Popular Music: Vous savez trouver (Chantrier); Airs from White Horse Inn (Stolz), La Vie parisienne (Offenbach) and Miss Helyett (Audran). 7.15, News. 7.30, Suite, Iberia (Albéniz) by a Symphony Orchestra. 7.45, Accordion Solos. 8.0, Opera Airs: Selection from La Dame blanche (Boieldieu); Overture, La belle Hélène (Offenbach); Selection from Mignon (Thomas). 8.15, Sound Film Music. 8.30, Music by an Argentine Band. 8.45, Orchestral Music. 9.0, Variety Concert. 9.30, Concert: Liebestraum (Liszt); Melody (Bardi); Hungarian March; Angelus (Micheli); Melody (Lincke); Airs from La Favorita (Donizetti), Sigurd (Reyer), Hamlet (Thomas) and Boris Godunov (Mussorgsky). 10.0, Cinema Organ Solos. 10.15, News. 10.30, Concert for Listeners in Morocco: Chansonnettes; Selections from Rose Marie (Friml), The Land of Smiles (Lehar), and Viktoria and her Hussar (Abraham). 11.0, Recitations. 11.15, Dance Music. 12 Midnight, News. 12.5 a.m. **(Wednesday),** Spanish Songs. 12.15, Military Music. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—4.10 p.m., Dance Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio. Dopolavoro Notes and Gramophone Music. 6.0, Time. Report of the Geographical Society and Gramophone Music. 6.10, Market Prices. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, News and Gramophone Music. 8.0, Relay of an Opera. In the intervals, Talk and Art Notes. After the Programme, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—10.0 to 10.15 a.m., Religious Information in English. 7.0 to 7.15 p.m., Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 246.9 metres,** and **Salzburg, 1,373 kc/s, 218.5 metres.**—10.30 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer: Overture, Waldmeister (Joh. Strauss); You are my Heart's Delight from The Land of Smiles (Lehár); Selection from Die drei Wünsche (Ziehrer). 10.55, Weather. 11.0, Concert (contd.): March. Freiheitsjubel (Blankenburg); Waldrauschen an der Donau (Pfleger); Song, Tränen, von denen niemand weiss (Föderl); Mexican Serenade, Despedida (Tellier); Tone Poem Winterlegende (Werba); Waltz, Libelle (Bayer); Song, Das Lied von der grossen Pummerin (Arnold); Selection from Waltzes from Vienna (Strauss-Bittner-Korngold). 12 **Noon,** Time, Weather and Announcements. 12.10 p.m., Gramophone Concert: Heinrich Schlusnus: Ständchen (R. Strauss); Elisabeth Schumann: Wiegenlied (R. Strauss); Franz Steiner: Schlummerlied (Schubert); Josef Manowarda: Die Fussreise (Wolf); Ippolito Lazaro; Aria from Aïda (Verdi); Felicie Hüni-Mihacsek: Aria from Così fan tutte (Mozart); Challapin: Rondo from Faust (Gounod); Battistini: La Mantilla (Alvarez); Caruso: Canta pé mé (de Curtis); Joseph Schmidt: Vorrei morire (Tosti); Galli-Curci: The Gipsy Girl and the Bird (Benedict); Miguel Fleta; Granadian (Nin). 2.0, Time and Market Prices. 2.20, Programme for Children. 2.55, Choral Concert (on Gramophone Records). Scala Milan Choir: Chorus from Othello (Verdi); Scala Milan Choir: Scene from Turandot (Puccini); Cambon and Daller and the Paris Opera House Choir: Prologue to Boris Godunov (Mussorgsky); Bruno-Kittel Choir: Finale from the Matthew Passion (Bach). 3.20, Talk. 3.50, Talk on Gliding. 4.0, Talk: Autumn in the Salzkammergut. 4.20, Soprano and Pianoforte Recital by Dagmar Schmedes and Irene Klimunda. Soprano Songs (Schumann): (a) Interrmezzo, (b) Wer machte dich so krank, (c) Marienwürmchen, (d) Ich grolle nicht; Five Songs from the Dafnis-Liedern (Blümel); Pianoforte Solos: (a) Polonaise in C (Beethoven), (b) Sonata in F sharp, Op. 78 (Beethoven). 5.5, Talk: Greek Philosophy and the Christian Church in the Early Middle Ages. 5.30, French Lesson. 6.0, Military Band Concert. 6.55, Time and Weather. 7.0, Der Bergsee—Play in Two Acts and a Prelude (Bittner). In the interval at 8.30, News. 9.30, Topical Talk. 9.45, Announcements. 9.50, Gramophone Dance Music.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from the Tower of St. Mary's Church, Cracow. 11.5, Concert of Light Music, relayed from **Lwów, 788 kc/s, 381 metres.** 11.30, Radio Journal. 11.35, Weather. 11.38, Concert Relay (contd.). 12 **Noon,** Interval. 2.30 p.m., Economic Notes. 2.40, Talk with Gramophone Illustrations: The Quartets of Beethoven. 3.25, Talk: The Savings Bank. 3.40, Talk on the Polish Language. 3.55, The Birth of the Symphony—Concert by the Station Symphony Orchestra, conducted by Glinski. Soloists: Lipowska (Soprano) and Lefeld (Pianoforte). Introductory Talk; Symphony in D Minor (F. Bach); Pianoforte Concerto in G (P. E. Bach); Selection from Iphigenia in Aulis (Gluck); Aria from Richard Cœur de Lion (Grétry); Symphony in D (Haydn). 4.50, Agricultural Talk. 5.0, Talk: Picasso and Braque, the Creators of Cubism. 5.20, Answers to Music Queries. 5.35, Jazz Music (on Gramophone Records). 6.5, Miscellaneous Items. 6.25, Topical Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Programme for the Fortieth Anniversary of the Death of Tchaikovsky; Talk; Symphony, No. 6—the Pathetic. 8.0, Reading. 8.15, Pianoforte Recital by Münza; Melody (Gluck-Sgambati); Minuet (Haydn); Variations (Brahms-Paganini); Prelude (Rachmaninov); Andalouse (Falla); Prelude (Gershwin); Waltz-Impromptu (Liszt). 9.0, Sports Notes. 9.10, Dance Music, relayed from the Gastronomia Café. In the interval at 10.0, Aviation Weather Report and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

WEDNESDAY
NOVEMBER THE EIGHTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes, Agricultural Report and Weather. **7.20,** Popular Melodies. **7.55,** News. **8.0,** Time and Lottery Results. **8.10,** Concert by the Station Orchestra, conducted by Henry Defosse: Overture, Der Freischütz (Weber); Ballet de cour (Pierné); English Suite of the Sixteenth Century (Rabaud); The Unfinished Symphony (Schubert); Persian Dance (Guiraud). In the interval at **8.45,** News and Gramophone Records. **9.30,** News. **9.35,** Choral Music. **9.45,** Recitations. **9.55,** News.

ATHLONE

725 kc s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc s, 224.4 metres.**—**1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gaelic Talk. **7.15,** German Lesson. **7.30,** Time Signal. **7.31,** Concert by the Station Orchestra. **8.0,** Relay of the Dublin Operatic Society Concert. **9.0,** Talk: The Catholic Heritage in English Literature. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert of Dance Music: Signature Tune; Don't be late in the Morning; Home-made Heaven (Rainger); Don't Blame me (Fields); Home on the Range (Traditional); Niagara Moon (Heymann). **9.45,** Broadcast of Dance Music: This time it's love (Lewis); Happy as the Day is long (Koehler); I'm forgetting myself for you (Meyer); Farewell to Arms (Wrubel). **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Dance Music: Moon Song; Dream on; The Last Round Up; Six or Seven Times; Under a Blanket of Blue; I lay me down to sleep; Waltzing in a Dream. **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** Irish Music. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Concert: Prelude to Le Déluge (Saint-Saëns); Spanish Serenade (Chaminade); Gavotte (Lully); Selection from Sappho (Massenet); Aubade (Caludi); Andante (Glazunov); Silhouettes (Enving). **7.0,** Request Gramophone Records. **7.30,** Exchange and Gramophone Records (contd.). **8.0,** Gramophone Music and News. **8.30,** Catalan Educational Programme: Geography and History Lesson. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5,** Concert by the Radio Orchestra. **10.0,** Concert by a Mandoline Orchestra. Conductor: Félir de Santos Sebastian: Adagio from the Pathetic Sonata (Beethoven); Minuet (Godard); Träumerei (Schumann); Selection from Cavalleria rusticana (Mascagni); En badinant (d'Ambrosio); Chanson triste (Tchaikovsky); Moment musical (Schubert); Sardana (Morera). **11.0,** News, followed by Dance Music, relayed from the Casa Llibre. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Children. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**5.55 p.m.,** Time and Programme Announcements. **6.0,** Talk. **6.30,** Yugoslavian Song Recital by Mme. Sultana Savic-Cijuk. **7.0,** Concert, relayed from **Ljubljana, 522 kc/s, 574.7 metres. 9.10,** Time and News, followed by Concert by the Radio Orchestra. **10.0,** Popular Music on Gramophone Records.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**11.0 a.m.,** Weather. **11.5,** Gramophone Concert: The Cuckoo and the Nightingale (Handel); Haydn Potpourri; Das Veilchen (Mozart); Minuet (Beethoven); Moment musical (Schubert); Gnomenreigen (Liszt); La danza (Rossini); Perpetuum mobile (Weber); Träumerei (Schumann); Ecossaises (Beethoven); Albumblatt (Wagner); Ständchen (R. Strauss); Russian Theme from the Serenade, Op. 48 (Tchaikovsky); Melody (Gluck); Arabic Dance (Grieg); Trepak (Mussorgsky). **After the Concert, Weather. 11.55,** Time. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Gramophone Concert; Part I, German Dances: Three Dances (Haydn); German Dances (Mozart); German Dance No. 12 (Beethoven); Part II, Waltzes by Chopin: Waltzes (a) in E Flat, (b) in F, (c) in A Flat, (d) in G Sharp Minor. **1.30,** The Day's Watchword. **1.35,** Gramophone Concert (contd.): Part II, Lullabies and Serenades: Schlafe, mein Prinzchen, schlaf ein (Mozart); Wiegenlied (Brahms); Wigenlied (R. Strauss); Serenade (Tchaikovsky); Serenade (Drigo); Spanish Serenade (Rouald). **2.0,** Talk for Young People: Games and Sports in Spain. **2.30,** Weather and Exchange. **2.45,** A German Fairy Tale. **3.0,** See **Hamburg. 4.0,** Dr. Otto Dietrich reads from his Book: Mit Hitler in die Macht. **4.20,** Concert by the Beethoven Choir and the Stein-Hardenberg School Orchestra, conducted by Kurt Kreuz: Two Mottoes; Minuet from the Symphony in E Flat (Mozart); Choir: (a) Der bückliche Fiedler (Brahms), (b) Der Kuekuck (Lemblu), (c) Bohemian Folk Song, Annchen lieb, Annchen traut; Songs by Five Boys: (a) Es fing ein Knab' ein Vögelein, from Götz von Berlichingen (Reinecke), (b) Die Henne (Brahms), (c) Der Schmied (Brahms); Choir, Folk Song, Wenn die Bettelleute tanzen; Two Folk Melodies; Three Songs (Brahms): (a) Himmel strahlt so helle und klar, (b) Rote Rosenknospen, (c) Brennessel steht am Wegesrand. **5.0,** The Day's Watchword. **5.51,** Organ Recital by Hans Georg Görner: O Mensch bewein Dein Sünde gross (Bach); Präludium and Fugue in B Minor (Bach); Invocation from the Sonata in D Minor (Reger). **5.30,** Germany and the Treaty of Versailles—A Radio Sequence. **5.50,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.0,** To-day's Motto. **7.5,** Dance Music by Robert Gaden's Band. **9.0,** News. **9.45,** Weather. **10.0,** See **Frankfurt. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.**—**3.30 p.m.,** String Quartet in D (Höber). **4.0,** See **Berlin (Deutschlandsender). 4.20,** To-day's Watchword. **4.25,** Report by an Unemployed Man on obtaining Work. **4.45,** Radio Sequence. **5.5,** See **Berlin (Deutschlandsender). 5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.5,** Concert of Light Music by the Berlin Orchestra of Unemployed Musicians. In an interval at **8.0,** Programme by Heck and Meck. **9.0,** Weather and News, followed by Light Music on Gramophone Records. **10.10** till Close Down, Programme relayed from **Munich.**

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News. **7.40,** Theatre Review. **7.55,** Lottery Results. **8.0,** Agricultural Talk. **8.15,** News. **8.30,** Concert by a Symphony Orchestra and Soloists.

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**4.55 p.m.,** Hungarian Programme: Notes for Women, Talk on Beethoven, a Scene featuring Liszt and Wagner, and Pianoforte Solos by Németh: Consolation (Liszt); Etude (Liszt). **5.55,** Notes for Housewives. **6.0** till Close Down, See **Prague. 9.15** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**11.0 a.m.,** Weather. **11.5,** Concert from **Leipzig. 12.45 p.m.,** Time and News. **1.10** (from **Gleiwitz**), Schubert Song Recital by Agnes Pollok (Soprano). **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.15,** Prussian Discipline—Reading from the Manuscripts of an Officer of Frederick the Great. **2.30,** Educational Talk. **3.0,** The Day's Watchword. **3.5,** Concert by the Upper Silesian Landestheater Orchestra, conducted by Erich Peter: Overture, Euryanthe (Weber); Im Brühlschen Hause; Friedemann—Bach Suite (Leuschner); Spanish Legend (Rust); Selection from Madame Butterfly (Puccini); Waltz, Wiener Blut (Joh. Strauss); Selection from Hansel and Gretel (Humperdinck). **4.35,** The Day's Motto. **4.40,** Fourteen Days of the Red Terror in the Vogtland. **5.0** (from **Gleiwitz**), Agricultural Prices. **5.5** (approx.), 'Cello and Pianoforte Recital of Old Dances by Walter Gola and Hanne Dintner. Gavotte (Lully); Bourrée (Handel); Minuet (Haydn); Ländler (Beethoven); Waltz (Kuhlau); Mazurka (Goens); Malaguena (Albeniz). **5.30,** See **Berlin (Deutschlandsener). 5.50,** Market Prices. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.0,** Programme to be announced. **9.0,** Austria. **9.25,** Time and News. **10.10** till Close Down, Programme relayed from **Munich.**

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News. Medical Talk. Broadcast for Workers and Talk on Politics and Psychology. **6.0** till Close Down, See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Max Alexys Orchestra. **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert. **5.0,** Concert by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp. **6.0,** Educational Talk. **6.15,** Pianoforte Recital by Mlle. Kinapenne. **6.45,** Recitations, Readings and Monologues. **7.15,** Gramophone Music: Aria from Fidelio (Beethoven); Italian Serenade (H. Wolf). **7.30,** Medical Talk. **8.0,** Programme by the Deltour Trio. **8.20,** Accordion Recital. **8.40,** Le personnage de Pierre—Radio Play (Jean Tengels). **9.0,** Concert by the Station Symphony Orchestra, conducted by Meulemans. Soloist: Clément Doucet (Pianoforte). Overture, Baruffe Chiozzote (Sinigaglia); Slav Rhapsody No. 1 (Friedemann); Pianoforte Solos: (a) Prelude and Fugue (Bach), (b) Saudades de Brazil (Milhaud); Piedmontese Dances (Sinigaglia). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—**12 Noon,** Gramophone Music: Acts I and II of La Bohème (Puccini); Overture, Masaniello (Auber). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Max Alexys Orchestra. **5.0,** Concert of Classical Music by the Station Symphony Orchestra, conducted by Arthur Meulemans; Soloist, Mme. Swaels-Wauters (Pianoforte): Overture, Fingal's Cave (Mendelssohn); Pianoforte Concerto in D Minor (Mendelssohn); Ballet Music from Rosamund (Schubert); Selection from Hermann and Dorothéa (Dupuis); La valse (Ravel). **6.30,** Talk: The Humorous Side of Life. **6.45,** Request Gramophone Concert: The Spinning Song (Mendelssohn); Duets from Acts I and II of Tosca (Puccini); La cathédrale engloutie (Debussy); Rondino on a Theme of Beethoven (Kreisler); Prélude à l'après-midi d'un faune (Debussy); Easter Overture (Rimsky-Korsakov). **7.30,** Interview with A. Van Hoogenbemt: Book Week. **8.0,** Der Orlov—Operetta (Granichstaedten), relayed from the Scala, Antwerp. In the intervals, Recitations and Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**11.0 a.m.,** Exchange, Market Prices and Gramophone Music. **12 Noon,** Radio Journal. **12.15 p.m.,** Gramophone Concert. **4.0,** Concert by the Station Orchestra: March (Friedemann); Waltz from The Yellow Jacket (Lehár); Overture, Der Opernball (Heuberger); Three Spanish Dances (Albéniz); Suppé Potpourri (Morena); Selection from Faust (Gounod); Chinese Intermezzo (Dicker); Serenade (Widor); Arabesque No. 2 (Debussy). In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Pianoforte Recital by Nadia Chebap: Italian Concerto (Bach); Romance in F Sharp (Schumann); Traumeswirren (Schumann); Tarantella (Liszt). **7.30,** Talk. **7.45,** Song Recital by Evantia Costinesco; Auf dem Wasser zu singen (Schubert); Two Arias from Figaro (Mozart); Poémes d'un jour (Fauré); Solveig's Song (Grieg). **8.5,** Violin Recital by Nina Alexandresco; Sonata No. 2 in A Minor (Schubert); Kadisch (Ravel); Rondo (Mozart-Kreisler). **8.35,** Radio Journal. **8.50,** Romanian Music by the Station Orchestra.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **6.45 p.m.** till Close Down.—**4.0, p.m.,** Cymbal Recital. **4.40,** Italian Lesson. **5.10,** Gramophone Music. **6.15,** Talk. **6.45,** Guitar Recital, with 'Cello and Celesta Solos and Songs. **7.45,** Time and News. **8.0,** Concert by the Opera House Orchestra, conducted by Ernst Dohnányi. Soloists: Ludwig Dömöter (Flute) and Nikolaus Rekai (Harp): Concerto for Flute and Harp (Mozart); Symphony No. 4 in D Minor (Schumann). **9.15,** Weather. **9.20,** Concert by the Imre Magyari Cigány Band. **10.20,** Pianoforte Recital: Variations (Brahms-Handel); Ballad in F Minor (Chopin); Ständchen (Schubert-Liszt); Empfehlung (Schumann-Liszt); Liebesleid (Kreisler).

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY, 31.51 metres.**—**11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.2,** Concert by the Arnold Nielsen String Ensemble, relayed from the Ritz Restaurant. **1.0 p.m.,** Interval. **2.0,** Gramophone Concert. **2.30,** Concert by the Radio Orchestra, conducted by Launy Gröndahl: Overture, Der Vampyr (Marschner); Waltz from The Dollar Princess (Fall); Extase (Ganne); Selection from Javotte (Saint-Saëns); Marcia reale italiana (Gabetti); Prelude to I Rantzau (Mascagni); Fantasia (Dupuy); Russian Lullaby (Gröndahl); Waltz, Golden Rain (Waldteufel); Albumblatt (Gyldmark); March from The Queen of Sheba (Gounod). In an interval at **3.15** (approx.), Talk for Women. **4.30,** Exchange and Fish Market Prices. **4.45,** Agricultural Talk. **5.15,** French Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk: Niels Skovgaard, the Painter. **7.0,** Time Signal from the Town Hall. **7.1,** Introductory Talk to the following Relay. **7.15,** Lilac Time—Operetta in Three Acts (Schubert-Berté), relayed from the Nörrebros Theatre. In an interval at **9.15** (approx.), News. **10.5,** Dance Music by the Jens Warny Band, relayed from the Nimb Restaurant. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**6.5 p.m.,** The Letter Box. **6.20,** Miscellaneous Items. **6.25,** See **Warsaw. 6.40,** Programme Announcements. **6.45,** See **Warsaw. 9.0,** Sports Notes. **9.10,** Talk in Esperanto: The Fifteenth Anniversary of the Polish Republic. **9.30,** Light Music, relayed from the Pavilion Restaurant. **10.30** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour: Part I—Request Concert of Gramophone Records: Signature Tune; Selection from the Merry Widow (Lehar); There's a Cabin in the Pines (Hill); Banjo Solo, The Wedding of the Painted Doll (Brown); Sylvia (Scollard); Gooseberry Tart (Matthews); Forty-Second Street (Dublin); Pianoforte Solo, Dancing Butterfly (Petkere); I had to go and find another job (Scott); Part II—Dance Music: Blue Cloud; You're an old Smoothie; Dinner at Eight; I'll take an option on you; Forever; With you here and me here; Goodnight little Girl of my dreams; Experiment; Signature Tune. **12 Noon,** Programme in French. **4.30 to 6.0,** Programme in English by the I.B.C. **4.30,** The I.B.C. Nursery Corner. **5.0,** Concert for the Isle of Wight: Request Programme of American Songs: Signature Tune, The Night by the Sea; The Whistler and his Dog (Pryor); I don't work for a living (Lee); Fortunes Galore (Reeves); Hallelujah, I'm a Bum (McClintock); The Phantom Brigade (Myddleton); The Railroad Boomer (Reeves); Smokey Mountain Bill; Naw! I don't want to be rich. **5.30,** Concert for Portsmouth and Southsea: Light Music; In the Valley where the Bluebirds sing (Salman); Song, Letting in the Sunshine (Gay); All over Italy (Munroe); Song, That's my Home (René); Pianoforte Solo, Selection from The Desert Song (Romberg); Any time, any day, anywhere (Washington); Polly (Zamecnik); Rosa Mia (Guizar); Signature Tune. **6.0,** Programme in French. **10.0** (approx.) till Close Down, Programme in English by the I.B.C. **10.0** (approx.), Dance Music; Signature Tune, Bells of Normandy; I'll show you off; Aloha O!; Sing another Line; Reflections in the Water; Oh, Johanna; Ding, Dong, Ding; Louisville Lady; Don't blame me; Tick, Tock; A Woman should stick to her Man; Isn't it Heavenly?; I've found the right girl; Let's call it a Day; Adios, Good-bye; My Moonlight Madonna (Tibich); Cecilia Mia (Frontela); Signature Tune. **11.0,** Talkie Time—Tunes from the Talkies; Signature Tune, Sittin' in the Dark; Selection from This Week of Grace (Farr-Davies); Three's a Crowd (Warren); The Wedding of Mr. Mickey Mouse; The Shadow Waltz (Dubin); Talking to you about me (Snyder); A nous la liberté (Auric); Let me give my happiness to you (Posford); Selection from Love me to-night; Signature Tune. **11.30,** Club Concert for Glasgow Listeners: Part I—Signature Tune, The Chum Song; The Glasgow Highlanders; Coming through the rye (arr. Smart); The Capricious Music Box (Fresco); Sciection from Chu Chin Chow (Norton); Violin Solo, Au Mois d'Avril (Adlington); The Foula Reel (Trad.); Annie Laurie (Scott); The Golden Musical Box (Krome). **12.5 a.m. (Thursday),** The I.B.C. Late News Bulletin in English. **12.10 a.m.** (approx.), Club Concert: Part II—Jericho (Myers); Just Friends (Lewis); Mona Lisa (Carter); Merry-go-round (Ellington); My Pretty Girl (Fulcher); Signature Tune. **12.30 a.m.,** Dance Music: Dinner at eight; Egypt; Lazybones; Wedding of the Dragon Flies; Goodnight, little Girl of my Dreams; Happy Ending; It's the Talk of the Town; Sweet Dreams, Pretty Lady; Carry me back to Green, Green Pastures. **1.0,** Dance Music: Signature Tune, The Bells of Normandy; The Wedding of Mr. Mickey Mouse; Shadows on the Swanee; Solitario; The Last Round Up; My Mother's Garden; I bring a Song; At the Old Pig and Whistle; Isn't

this a night for Love?; Whistling under the Moon; Wood Violets; Dancing Butterfly; Sweetheart Darlin'; Lay your head on my shoulder; Down in Montmartre; Sentimental Gentleman from Georgia; Sundown in a little Green Hollow; Signature Tune. 2.0, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. 12.25, News. **12.35 to 1.30,** See **Stuttgart. 1.30,** Programme for Young People. **2.30,** Weather. 2.40, Time and Economic Notes. **3.0,** See **Stuttgart. 4.0,** See **Berlin (Deutschlandsender). 4.25,** See **Stuttgart. 5.0,** See Langenberg. **5.50,** Weather and News. **6.0,** Transmission for all German Stations: Concert of Operetta Music by the Station Orchestra, conducted by Hans Rosbaud. **7.0,** Topical Talk. **7.10,** See **Langenberg. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** News. 9.45, Concert of Light Music. **10.0,** Waltz Music by the Station Orchestra, conducted by Hans Rosbaud. **11.0** till Close Down, See **Stuttgart. 12 Midnight** (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m.,** Concert by the Hamburg Philharmonic Orchestra, conducted by José Eibenschütz: Overture, Oberon (Weber); Prelude to Act II of Ingwelde (Max von Schillings); Three Swedish Folk Melodies (Kallstenius); Harlekin-Streiche (Schroeder); Selection from Firenze ridente (Raffaelli). **4.0,** See **Berlin (Deutschlandsender). 4.20,** Topical Talk. **4.50,** Impressions of a German Woman returned from Abroad. **5.0,** Variety Programme. **5.40,** Frankfurt Exchange and Hamburg Market Prices. **5.50,** Weather. **6.0,** Transmission for All German Stations, relayed from **Frankfurt. 7.0,** Programme to be announced. **9.0,** News. **9.20,** Concert of Light Music.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert. Italian Opera Music. Extracts from Cavalleria rusticana (Mascagni); Scene from La Traviata (Verdi); Benjamino Gigli and Ezio Pinza; Duet from Lucia di Lammermoor (Donizetti); Florence Austral and Browning Mummery: Duets from Il Trovatore (Verdi); Scene from La Gioconda (Ponchielli). In the intervals at 12.20 and 1.0, News. **1.30,** Programme arranged by the Post Office with Gramophone Records. **1.50,** Talk for Housewives. **2.0,** Market Prices. **2.5,** Light Music on Gramophone Records. **2.35,** Radio Sequence. **3.0,** Concert by the Königsberg Opera House Orchestra, conducted by Karl Hrubetz. March, Stramm und schneidig (Bartelmus); Overture, La dame blanche (Boieldieu); Waltz from Das Fürstenkind (Lehár); Viribus unitas (Richter); Selection from Das Veilchenmädel (Hellmesberger); March, Mit fliegender Fahne (Hrubetz). In the interval from **4.0 to 4.20, See Berlin (Deutschlandsender). 4.45,** Talk. **4.50,** Talk for Teachers. **5.15,** Market Prices. **5.20** (from **Danzig**). String Quartet in G Minor, Op. 27 (Grieg), by the Görlach Quartet. **5.55,** Weather. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.0,** News. **7.10,** Dance Music. **9.0,** News. **9.10** (approx.), Concert. **1.0** (approx.), Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.** and 20 kW. from **5.40 p.m.**—Programme of the Workers' Radio Society (V.A.R.A.). **11.40 a.m.,** Orchestral Concert, conducted by Wins: Motor March (Rosey); Nachtschwärmer (Ziehrer); De Lion (Tosti); Rainbow (Wenrich); Dolores (Valerio); Strauss Potpourri (Weber); Gramophone Records; Gavotte (Manfred); Argentine Tango (Lucchesi); Eternal Love (Barbirolli); Hungarian Dance (Brahms); Gipsy Moon (Borganov); Lehár Potpourri (Hubay); Gramophone Records; Rococo (Translateur); Temptation Rag (Lodge); Dance of the Butterflies (Kockert); Why? (Lasso-Valerio); Mein Glück bist du (Jurmann); Melody (Riccardo). **1.40 p.m.,** Interval. **1.55,** Gramophone Music. **2,40,** Programme for Children. **4.10,** Trio Concert. **6.10,** Talk on Thomas More. **6.40,** Talk. **7.0,** Concert by the V.A.R.A. Orchestra, conducted by de Groot: Wedding March (Mendelssohn); A Wedding Day on Troldhaugen (Grieg); Scandinavian Wedding Suite (Juel-Frederiksen). **7.40,** News. **7.55,** Concert (contd.): Selection from Lohengrin (Wagner); De roode Vlag (Broeckx-Renes); Overture, Maximilieu Robespierre (Litolff); Tales from the Vienna Woods (Joh. Strauss); Träumerei (Schumann); Das Glöcklein im Tale (Sackur); Bizet Potpourri (Urbach). **8.40,** The Machine—Play (Heyremans), arranged for Radio by Duin. **9.0,** Concert (contd.): Chiquita (Benker); Overture, Hokus Pokus (Leuschner); Melody (Ketelbey); Gipsy Idyll (Ferraris); The Toymaker's Dream (Golden); Valse des Brunettes (Ganne); Selection from Les Saltimbanques (Ganne). **10.0,** News. **10.10,** Concert of Light Music.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.**—Programme of the Christian Radio Society (N.C.R.V.). **10.40 a.m.,** Pianoforte Recital by Hans de Bock: Adagio from the Moonlight Sonata (Beethoven); Gavotte (Martini); Four Pieces (MacDowell); Une larme (Mussorgsky); Gramophone Records; Pieces (Vredenburg); Evocation (Voormolen); Melody (De Bock); Three Chinese Pieces (Tsjeng Feng). **11.40,** Police Announcements. **11.55,** Gramophone Music. **12.10 p.m.,** Quintet Concert. In the interval, Gramophone Records. **1.40,** Gramophone Music. **2.10,** Talk on Stamp-collecting. **2.40,** Concert of Chamber Music by Mme. A. de Vink-Verschoor (Soprano), Mlle. Geuze (Mezzo-Soprano), Amersfoort (Violin), and Schellevis (Pianoforte); Ach mein Herzliebes Jesulein (Schellie); Sonata in D (Händel); Der Freiheit nur from Judas Maccabäus (Händel); Er kennt die rechten Freudenstunden from Cantata No. 93 (Bach); Two Duets (Cooper); Grave (W. F. Bach); Die Einsiedler (Herzogenberg); Gebet (Herzogenberg). **3.25,** Interval. **3.40, Concert** (contd.): Andante from the Violin Concerto (Mendelssohn); Ordisson (Chausson); D'une Prison (Hahn); La Procession (César Franck); Gramophone Records; Berceuse (Lecocq); Japanisches Regenlied (Marx); An einen Herbstwald (Marx); Die Frau vor dem Spiegel (Michielsen); Und hab so grosse Sehnsucht doch (Frensel-Wegener); Ghasel (Zagwijn). **4.40,** Programme for Children. **5.40,** Agricultural Talk. **6.10,** Talk on Horticulture. **6.40,** Police Announcements. **6.55,** Religious Information. **7.10,** Gramophone Music. **7.25,** Wireless Notes. **7.40,** Gramophone Records. **7.55,** Concert by the Arnheim Orchestra, conducted by Spaanderman. Soloist: Brill ('Cello). Selection from A Midsummer Night's Dream (Mendelssohn); Prelude to Lohengrin (Wagner); Rococo Variations (Tchaikovsky); Gramophone Records; Symphony No. 4 (Beethoven). **9.45,** News. **9.55,** Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide Financial Notes, Racing Results and News. **8.10,** Oceanographic Report. **8.20,** Tourist Talk. **8.35,** Radio Concert. **9.0,** News and Weather. **9.15,** Guilloux Recital.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.,** News and Weather. **12.35,** See **Stuttgart.** In the interval at **1.0,** Talk: The Watchword. **1.30,** See **Frankfurt. 2.30,** Talk on Economics. **2.50,** Political Address. **3.0,** See **Stuttgart. 4.0,** See **Berlin (Deutschlandsender). 4.20,** Talk: The Watchword. **4.25,** See **Stuttgart. 5.0,** Concert of Dutch Folk Music. **5.50,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.0,** See **Frankfurt. 7.10,** Concert by the Station Orchestra, conducted by Buschkötter. Soloist: Anton Schoenmaker (Violin); Violin Concerto in D (Witte); Symphony in C. No. 43 (Haydn). **8.15,** Humorous Programme, with Light Music. **9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** News. **9.45 to 11.0,** See **Frankfurt. 9.45 to 11.0,** See **Frankfurt. 11.0,** Programme from **Munich. 12 Midnight** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—11.5 a.m.,** Concert by the Emdé Orchestra: March, Mit Mut und Kraft (Blon); Overture, Maritana (Wallace); Czardas (Stephan); Waltz, Rudolfklänge (Joh. Strauss); Ballet Music from Lakmé (Delibes); Es muss ein Wunderbares sein (Liszt); Fest der Zwerge (Noack); Potpourri, Hoch deutscheslied (Hohmann-Webau); Waltz, Winterstürme (Fucik); Serenade; Purzels Rendezvous (Schramm); Gavotte in B flat (Rehberg); Selection from Gri-Gri (Lincke); Intermezzo; Im Tempel der Schönheit (Hummel); Bayerisch Blau (Friedemann). In an interval at **12.15 p.m.,** News. **1.0,** News. **1.15,** Interval. **2.10,** Radio Sequence. **2.30,** To-day's Watchword. **2.35,** Market Prices. **3.0,** Programme for Young People. Part I: Folk Songs. Part II: Mit dem Töpferwagen durch Deutschland—Radio Play (Kuhnert). **4.25,** Folk Songs to the Lute. **5.0,** See **Berlin (Deutschlandsender). 5.20,** Viennese Waltzes (Gramophone Records). **5.40,** To-day's Watchword. **5.45,** Economic Notes and To-day's News. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.0,** Vater ist dagegen (Father is against it)—Radio Play. **8.0,** Concert of Folk Songs by the Station Orchestra, conducted by Hilmar Weber: Italia Canora (Leopold); Balalaika-Klänge (Weninger); Hungaria (Leopold); German Folk Song Fantasia (Blumer). **9.0,** News. **10.0,** Concert by the Leipzig Symphony Orchestra, conducted by Theodor Blumer: Overture, Preciosa (Weber); Selection from Eugene Onegin (Tchaikovsky); Pianoforte: Extracts from Bilder vom Chiemsee Op. 131 (Niemann); Waltz, Wo die Zitronen blüh'n (Joh. Strauss); Overture, The Merry Wives of Windsor (Nicolai). **11.0** (appros.). Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.,** Concert of Chamber Music. **5.30,** Concert by the Station Orchestra. **6.0,** Talk. **6.30,** Literary Talk. **7.0,** Song Recital. **7.40,** Concert by a Vocal Quintet. **8.20,** Concert by the Station Orchestra. **9.0,** Weather and News. **9.15** (approx.), Dance Music.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—Luxembourg Evening. **7.0 p.m.,** Concert by the Station Orchestra, conducted by Pensis. Soloist: Venant Pauké (Baritone). Overture, Prometlius (Beethoven); Invitation to the Waltz (Weber); A Night on the Bare Mountain (Mussorgsky-Salabert); Baritone Solos: (a) Rosenlieder (Eulenburg), (b) Ungeduld (Schubert), (c) Die beiden Grenadiere (Schumann). Sur le lac (Godard); An den Frühling (Grieg). **8.0,** Orchestral Concert. **8.35,** News in French. **8.45,** See **Paris (Radio-Paris).** In an interval, News in German. **10.30,** Dance Music on Gramophone Records.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.,** See **Warsaw. 6.40,** Programme Announcements. **6.45,** See **Warsaw. 9.10,** Esperanto Talk, relayed from **Cracow, 959 kc/s, 312.8 metres. 9.30,** See **Warsaw. 10.5,** Gramophone Music. **10.30** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South-East. **8.30,** Dramatic Programme—Radio Sketches by Tristan Bernard. After the Programme, News Bulletin.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Popular Concert. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12.0 Midnight** till Close Down. Programme in English by the I.B.C. Concert by the International Broadcasting Company (Ireland), Ltd. Signature Tune: Come back to Erin; Melody from The Flower of Hawaii (Abraham); Just like in a Story Book (McCarthy); The Cuban Love Song (Stothart); Hot Feet (McHugh); Montana Call (Stothart); Fiesta (Samuels); Black Eyes (Traditional); Selection from The Gipsy Princess (Kálmán); Signature Tune: Come back to Erin. **12.30 a.m. (Thursday),** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Radio Journal and Request Gramophone Records. **8.15,** Topical Review. **8.30 to 9.30,** Interval. **9.30,** Chimes, Time and Topical Review. **9.45** (approx.), Concert by the Madrid Symphony Orchestra, conducted by Enrique Fernández Arbós. **11.45,** Topical Review. **12.0** Midnight, Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**3.0 p.m.,** Police Band Concert, conducted by Sochor.

NOV. 8th WEDNESDAY *continued*

3.50, See **Prague. 5.5,** Talk on Finance. **5.15,** Dance Music. **6.0,** See **Prague. 6.10,** Talk: Culture in Czechoslovakia. **6.25** till Close Down. See **Prague. 9.15** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.—10.45 a.m.,** Weather. **12.0 Noon,** Literary Programme. **1.0 p.m.,** Concert. **2.0,** Princess Turandot—Play (Gozzi). **3.30,** Concert. **4.30,** Programme for Young People. **5.30,** Concert, relayed from the Conservatoire. **8.0,** News. **8.30,** Programme Announcements. **8.55,** Chimes. **9.5,** Press Review. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.,** Concert by the Povolny Chamber Orchestra: Traurige Weise (Suk); Overture, Egmont (Beethoven); Lullaby and Reverie (Sgambati); Waltz, Neu-Wien (Joh. Strauss). **4.0,** See **Berlin (Deutschlandsender). 4.20,** Concert (contd.): Selection from Cavalleria rusticana (Mascagni); Minuet (Mozart); Selection from Gasparone (Millöcker); Florentine March (Fucik). **5.0,** The Watchword. **5.5,** Sonata for Violin and Pianoforte, Op. 96 (Beethoven), by Melanie Michaelis (Violin) and Richard Staab. **5.25** (from **Nürnberg**), Talk: The Mechanisation of the Army. **5.45,** Time and Announcements. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.0,** Variety Programme. **8.35,** Chamber Music. **9.0,** Austria. **9.25,** Time and News. **10.0,** Die historische Nacht (November 9th, 1923). **11.0,** Die Nacht der Toten—Memorial Programme for the Fallen (November 9th, 1923).

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsground, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jeloy, LCL.—4.0 p.m.,** Gramophone Concert. **5.0,** French Lesson. **5.30,** Programme for Boys. **6.0,** Announcements, Weather, and News. **6.30,** Astronomical Talk: The Earth and the Planets. **7.0,** Time Signal. **7.1,** Kierulf Concert by the Station Orchestra, conducted by Kramm. Soloist: Elizabeth Munthe Kaas (Soprano). Suite; Three Songs: (a) Adtenstemning, (b) Längsel, (c) Synnöves sang; Four Pieces for String Orchestra; Songs: (a) Gus var det kvar, (b) Hjemad, (c) Min elskde jeg er bunden; Berceuse and Danse sauté. **8.0,** Talk on Martin Luther. **8.30,** Agricultural Report. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Weekly Review and Songs. **9.45,** Dance Music. **11.0** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PARIS

EIFFEL TOWER; Call FLE; 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot signals).—**5.45 p.m.,** Le Journal Parlé **8.15,** Mozart Concert by the Station Symphony Orchestra, conducted by Flament. Soloist: Cantrelle (Violin). Overture, Il Seraglio; Minuet from the Divertissement No. 17 for Strings; Violin Concerto in E Flat; Overture, The Magic Flute; Andante for Strings; Overture, Figaro. **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Overture, William Tell (Rossini), on Gramophone Records. **7.15,** Le Journal Parlé. **7.30,** Sponsored Gramophone Concert. **8.0,** Social Insurance Report. **8.30,** Teddy and Partner—Play (Yvan Noé). **10.30,** Sponsored Concert, relayed from the Champs-Elysées Restaurant. **11.0,** News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s,, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** Interval. **12 Noon,** Education Talk. **12.15 p.m.** Gramophone Concert. La petite Margot (Lenoir); Tu m'oublieras (Lenoir); C'était un rêve (Maquis); La sarabande des nuits (Mario); Tu m'as juré (Matis-Lenoir). **12.30,** Organ Recital by Desserre. Overture, Le cordonnier et le financier (Ardely); Vous riez de moi (Jones); Selection from Christiné (Salabert); What a Perfect Combination (Ruby). **1.0,** Exchange. **1.5,** Gramophone Concert (contd.). French Operetta Music. Airs (Offenbach) from (a) Madame Favart, (b) Madame l'Archiduc, (c) La belle Hélène, (d) La périchole. (e) Les brigands: Selection from Les mousquetaires au couvent (Varney); Selection from Ciboulette (Hahn). In the interval at **1.30,** Exchange. **2.0,** Exchange. **3.45,** Exchange and Market Prices.

NOV. 8th WEDNESDAY *continued*

5.20, Agricultural Talk. 6.45, Reading. 7.0, Medical Talk. 7.20, Concert of Light Music. 8.0, Madrigals and Epigrams of the Seventeenth and Eighteenth Centuries. 8.30, News and Weather. 8.40, Fashion Talk. 8.45, Concert by the Colonne Concert Society, conducted by Paul Paray. Symphony in E flat (Mozart); Nocturne and Scherzo from A Midsummer Night's Dream (Mendelssohn); Pavane pour une infante défunte (Ravel); Symphony No. 4 (Schumann). In the interval at 9.15, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.,** Musical Originalities, from **New York.** **7.30,** KDKA Home Forum. **8.0 to 9.30, New York** Relay. **8.0,** U.S. Navy Band. **8.15,** Utility Hall. **8.30,** Dixie Days. **9.0,** Betty and Bob. **9.15,** Southern Symphonies. **9.30,** Frances Ingram. **9.45,** News and Markets. **10.0,** Uncle Tom and Betty. **10.15,** KDKA Kiddies' Klub. **10.30,** Singing Lady, from **New York.** **10.45,** Orphan Annie, from **New York.** **11.0,** News; Pat Haley. **11.15,** Sports; Programme Preview. **11.30,** Evensong. **11.45 to 12.30 a.m. (Thursday), New York** Relay. **11.45,** Lowell Thomas. **12 Midnight,** Amos 'n' Andy. **12.15,** Gems of Melody. **12.30,** What would you do? **12.45 to 3.30, New York** Relay. **12.45,** Irene Rich for Welch. **1.0,** Crime Clues. **1.30,** Dangerous Paradise. **1.45,** Red Davis. **2.0,** Warden Lawes. **2.30,** John McCormack and Orchestra. **3.0,** Pedro Via's Orchestra.

PORSGRUND.—See **Oslo.**

POZNAN

POLSKIE RADIO, 897 kc/s, 334.4 metres; 1.5 kW. **6.5 p.m.,** Miscellaneous Items. **6.25,** See **Warsaw.** **6.40,** Programme Announcements. **6.45,** See **Warsaw.** **9.0,** Time and Sports Notes. **9.10,** Talk: The Development of the Dutch Press. **9.25,** See **Warsaw.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Moravská-Ostrava.** **3.50,** Marionette Play. **4.35,** Gramophone Music. **4.45,** Talk: Book-binding. **4.55,** Gramophone Music. **5.5,** Agricultural Report. **5.15,** Talk for Workers. **5.25,** News in German. **5.30,** German Transmission: Talk on the Labour Exchange. **6.0,** Time and News. **6.10,** French Lesson. **6.25,** Scene from The White Mountain (Historical Trilogy (Arnost Dvorák). **7.0,** Talk on the following Transmission. **7.5,** Suk Concert by the Philharmonic Orchestra, conducted by Talich, relayed from the Smetana Hall: Music to Radúz and Mahulena, Op. 13. Asrael Symphony in C Minor, Op. 27. In the interval, Talk: The White Mountain. **9.0,** Time and News. **9.15,** News in French. **9.30** (approx.). Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres, 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.** **6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Lausanne**), Gramophone Concert. **12 Noon** (from **Lausanne**), Financial Notes. **12.10 p.m.** (from **Lausanne**), Gramophone Concert. **1.0 to 2.58,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0,** See **Schweizerischer-Landessender.** **5.0** (from **Geneva**), Programme for Children. **6.0** (from **Geneva**), Science Talk. **6.30** (from **Geneva**), Radio Chronicle. **6.59** (from **Geneva**), Weather Report. **7.0** (from **Geneva**), Song and Pianoforte Recital: Song, Serre-moi dans tes bras (Balakirev); Pianoforte Solo, Calouette (Glinka); Songs: (a) Italian Serenade (Chansson), (b) Two Songs (Strong); Pianoforte Solo, Sketches (Maresco tti). **7.20** (from **Geneva**), Talk: The Youth of James Fazy. **7.45** (from **Geneva**), Variety Concert by the Melody Dance Band. **8.50,** News and Weather. **9.0** (from **Geneva**), Talk: The Work of the League of Nations. **9.30** (approx.). Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**11.0 a.m.,** Weather. **1.15 p.m.,** Concert. **5.0,** Weather. **8.5,** Musical Programme. **8.30,** Weather. **8.40,** Musical Programme and Announcements. **9.0,** Chimes and News. **9.30,** Reading. **10.0,** Opera Music.

RIGA

571 kc/s, 525.3 metres; 15 kW. **6.5 p.m.,** The Animal Kingdom in Music. Concert: Dance from The Swan Lake (Tchaikovsky); The Girl and the Bee (Goldmark); In the henhouse (Bortkiewicz); The Butterfly Chase (Keler-Bela); Song of the Nightingale (Filipovsky); The Cat and the Mouse (Engelmann); Flowers and Butterflies (Wesley); The Old Bear growls (Fucik); Glow-Worm Idyll (Lincke); The Nightingale (Edegberg); The Turkey-Cocks Procession (Petras). **7.0,** News. **7.20,** Recital of Songs and Arias. **7.40,** Orchestral Concert, conducted by Medins: Second Suite from L'Arlésienne (Bizet); Liebesfreud (Kreisler); Selection from Der Freischutz (Weber). **8.0,** Weather and News. **8.30,** Popular Concert. **9.30** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.,** and **2RO** (See Short-Wave List).—**12 Noon to 1.15 p.m.,** Orchestral Concert of Light Music. In the interval from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.55,** Giornale Radio, Exchange and Report of the Royal Geographical Society. **4.10,** Weather. **4.15 to 5.0,** Orchestral Concert: Melody (Solazzi); The Golden Spinning Wheel (Dvorak); Lo straccivendolo milanese (Culotta); Guitar Solo: Hawaiian (Culotta); Selection from Adriana Lecouvreur (Cilea); Melody (Claret); Le campane di San Benedetto (Limentai); L'allegra parata (Montagnini). **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Dopolavoro and Tourist Report. **5.57,** Report of the International Institute of Agriculture (in Italian and English). **6.10,** Wheat Market Report. **6.40,** Giornale Radio. **7.0,** Time, Announcements and Gramophone Music. **7.15,** Medical Talk. **7.30,** Giornale Radio and Sports Notes. **7.45,** Violin Recital by Giacomina Protto: Sicilienne and Rigaudon (Francœur-Kreisler); Larghetto (Weber); Ritmi (Castelnuovo-Tedesco). **8.0,** Transmission of an Opera. Talk and Announcements in the interval. Giornale Radio after the Programme.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.**—**7.30 p.m.,** Two Seats in the Balcony, from **New York.** **8.0 to 8.30,** Grande Trio, from **New York.** **12.45 a.m. (Thursday),** Stock Reports. **1.0 to 3.30, New York** Relay. **1.0,** George Olsen's Orchestra. **1.30,** Abe Lyman's Orchestra with Frank Munn (Tenor). **2.0,** Ipana Troubadours. **2.30,** Leo Reisman's Orchestra. **3.0,** Variety Programme. **3.30,** National Radio Forum from **New York,** followed by Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.: **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **9.20** (from **Basle**), Broadcast for Schools. **9.50 to 11.0,** Interval. **11.0** (from **Berne**), Chamber Music on Gramophone Records. **11.29,** Time Signal from Neuchâtel Observatory, Weather and News. **11.40** (from **Berne**), Music which fell flat: Recital of Once-rejected Masterpieces, with Commentary. **12.25 p.m.** (from **Berne**), Time, Weather and Exchange. **12.30** (approx.) **to 2.30,** Interval. **2.30** (from **Berne**), Programme for Women. **3.0** (from **Berne**), Concert by the Radio Orchestra. **3.30,** Vocal Duets. **4.0,** Opera Music on Gramophone Records. **4.30,** Chamber Music. **5.0** (from **Berne**), Programme for Children. **5.30** (from **Zürich**), Technical Wireless Talk. **6.0** (from **Zürich**), Time, Weather and Market Prices. **6.10** (from **Zürich**), Song Recital by Arthur Köst. **6.20** (from **Zürich**), English Lesson. **6.50** (from **Zürich**), Wenn wir uns wiedersehen (When we meet again)—Play (Karl Wilczinsky). **8.0,** Weather and News. **8.10** (from **Zürich**), Organ Recital. **9.25** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Horby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**12 Noon to 12.30 p.m.,** Broadcast for Schools. **4.5 p.m.,** Accordion Music, relayed from **Orebro, 1,265 kc/s, 237.2 metres.** **4.30,** Radio Report. **4.45,** Gramophone Music. **5.45,** Talk: The English Law Courts, relayed from **Karlstad, 1,382 kc/s, 217 metres.** **6.15,** Weather and News. **6.30,** Chamber Music. Littie Andreasson (Violin), Sigurd Rydberg (Oboe), Roman Dukstulsky (Cello) and Ingrid Kjellström-Stenbäck (Harpsichord). Sonata in G minor for Oboe and Harpsichord (Telemann); Trio for Oboe, Violin, Cello and Harpsichord (Graun). **7.0,** Discussion: Young People and Education. **7.45,** Choral Concert with Organ Solos: Five Songs; Organ Solos (Sjögren): (a) Nenia, (b) Legend, (c) Prelude and Fugue in A minor; Three Songs. **8.45,** Weather and News. **9.0,** Dance Music relayed from Berne Hall.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Variety Music on Gramophone Records. **12.45 p.m.,** News. **1.0,** Time and Exchange. **1.5,** Marches on Gramophone Records. **2.0,** Interval. **4.45,** Talk in German: Street Lighting by Electricity. **5.0,** Orchestral Concert, conducted by Roskam: Two Pieces from Vive Paris (Misraki); Overture, Lysistrata (Lincke); Foxtrot, Green Song (Allouche); Tango, Mi chiamo Anny (Savina and Suelto); Selection from The Geisha (Jones); Foxtrot, Let's call it a Day (Brown and Henderson); String Quintet: Les violons de M. de Conty (Wormser); Oboe and Orchestra: Gracieux Babil (Petit); Foxtrot, Please (Rainger); Two-Step, Torero fine (Lucchesi). **6.0,** Trio Concert, relayed from **Lille, 1,130 kc/s, 265.4 metres.** **7.0,** Talk: The Irish Question. **7.15,** Talk on the Mediæval Trade Guilds. **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German. Lottery Results and Announcements. **8.30,** Concert by the Municipal Orchestra, conducted by Hermann Scherchen, relayed from the Palais des Fêtes: Overture, To the Story of the Lovely Melusina (Mendelssohn); The Unfinished Symphony (Schubert); Symphony with Viola Obbligato, Harold en Italie (Berlioz). In an interval at **9.30** (approx.), Press Review. **10.30,** Orchestral Concert, conducted by Jemine, relayed from the Grand Kléber Tavern: Marche du Phénix (Eenhaes); Valse des brunes (Ganne); Fasching-traum (Mannfred); Overture, The Nuremberg Doll (Adam); Rendez-vous (Aletter); Selection from Aïda (Verdi); Selection from Die geschiedene Frau (Fall); Airs of Saint-Granier (Salabert); Vibraphone Solo; Marche Lorraine (Ganne). **11.30** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.35 p.m.,** Concert by the Mario Iseglio Orchestra. **1.30,** See **Frankfurt.** **2.30,** Gramophone Music. **3.0.** L'Elisir d'amor Opera (Donizetti), on Gramophone Records by the Cast of the Milan Scala. **4.0,** See **Berlin (Deutschlandsender).** **4.20,** To-day's Watchword. **4.25,** Variety Concert. **5.0,** See Langenberg. **5.50,** Time, Agricultural Report and Weather. **6.0,** Transmission for all German Stations, relayed from **Frankfurt.** **7.0,** See **Frankfurt.** **7.10 to 9.0,** See **Langenberg.** **9.0,** See **Frankfurt.** **9.20,** Topical Talk. **9.30,** News. **9.45,** See **Frankfurt.** **10.0** till Close Down. See **Munich.**

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Light Music. **6.50,** Talk. **7.15,** News. **7.30,** 'Cello Recital: Spanish Serenade (Glazunov); Minuet (Mozart); Prelude to Hérodiade (Massenet); Allegro appassionata (Saint-Saëns). **7.45,** Orchestral Music. **8.0,** Russian Songs with Balalaika Accompaniment. **8.15,** Extracts from Operettas: Les Dragons de Villars (Maillart); Un bon garçon (Yvain); Paganini (Lehár); No No, Nanette (Youmans). **8.30,** Opera Music: Airs from La Basoche (Messager); Pénélope (Fauré); Cavalleria rusticana (Mascagni); Manon (Massenet); Mignon (Thomas); Lakmé (Delibes); and Resurrection (Alfano). **9.0,** Orchestral Concert: Air from Héro-diade (Massenet); La guerre sainte (Hariny); La Garonne (Lacôme); Le nadal Toulousain (Moulnier); Au lever du jour (Boulanger); Toulousaine (Deffer). In the interval, Chansonnettes. **10.15,** News. **10.30,** Concert for Listeners in Morocco: Accordion Solos; Extracts from Sound Films. **11.0,** Light Music. **11.15,** Dance Music. **12 Midnight,** News. **12.5 a.m. (Thursday),** Music by a Symphony Orchestra: Overture, Anacréon (Cherubini); Overture, Euryanthe (Weber). **12.15,** Hawaiian Guitar Solos. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down. See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.,** Soprano Song Recital. **5.0 to 5.5,** Weather. **5.40,** Giornale Radio. Dopolavoro Notes and Gramophone Music. **6.0,** Time, Tourist Talk and Gramophone Music. **6.10,** Market Prices. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** News. **7.15,** Medical Talk. **7.30,** Gramophone Music. **8.0,** Relay of an Opera. In the intervals, Talk and Miscellaneous Notes. After the Programme, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in Spanish. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 652 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: Overture, The Gipsy Baron (Joh. Strauss); Schumann Fantasia (Schreiner); Waltz, Estudiantina (Waldteufel); Nocturne (Chopin); Song, Ich bin der Welt abhanden gekommen (Mahler); Hungarian Dances (Kéler-Béla). **12 Noon,** Time, Weather and Announcements. **12.10 p.m.,** Concert (contd.): Volksbund Marsch (Sternbach); Waltz, Brüderlein fein (Fall); Wanderlied (Engel); Pizzicato-Polka (Grünfeld); Karneval Miniaturen (Kaskel); Eine schlichte Weise aus erster Zeit (Reckenwald); Selection from Eva (Lehár). **2.0,** Time and Market Prices. **2.20,** Talk: Modern Lighting for the House. **2.30,** Talk for Teachers. **2.55,** Gramophone Records of Sound Film Music. **3.30,** Programme for Children. **3.55,** Talk on Art. **4.20,** Concert of Modern Austrian Chamber Music. Lotte Hammerschlag (Viola), Edith Wachtel (Pianoforte), Dr. Paul Lorenzi (Baritone), Friedrich Schönfeld (Flute), Ernst Netsch (Oboe), Franz Hunger (Clarinet), Hugo Rottensteiner (Bassoon), and Hugo Heinrich (Horn): Quintet in E flat for Flute, Oboe, Clarinet, Bassoon, and Horn (Rosenthal); Baritone Songs (Andergassen): (a) O Grille, sing! (b) Ferne Wege, (c) Tulpen im Spätherbst, (d) Gang in den Sommer; Sonata for Viola and Pianoforte (Reichel). **5.10,** Talk. **5.35,** Talk for Workers. **6.0,** 'Cello Recital by Gaspar Cassado. **6.50,** Time, Weather and Programme Notes. **7.0,** Topical Talk. **7.15,** Concert of Operetta Music by the Wiener Symphoniker, conducted by Josef Holzer. Soloists: Dina Grohmann (Soprano), Karl Ziegler (Tenor): Overture, Gasparone (Millöcker); Soprano Song from Eva (Lehár); Waltz, Roses from the South (Joh. Strauss); Was weiss ein nie geküsster Rosenmund, from A Kiss in Spring (Kálmán); Duet from Die Fledermaus (Joh. Strauss); March from A Waltz Dream (O. Straus); Tenor Solo, Song from The Blue Mazurka (Lehár); Tango from Der Orlov (Granichstaedten); Soprano Songs from The Duchess of Gérolstein (Offenbach); Selection from Countess Maritza (Kálmán); Duet, Pratermädel, das so innig küsst, from Das Mädchen im Mond (v. Stiegler); Waltz from Der Frauenfresser (Eysler); Soprano Solo, from The Czarevitch (Lehár); G'selleumarsch from Die goldne Meisterin (Eysler); Launische Dame, from Das süsse Mädel (Reinhardt); Gallop, Rasch wie der Blitz, from Der arme Jonathan (Millöcker). **9.0,** Esperanto Talk for Workers. **9.15,** News. **9.30,** Concert by the Four Funny Fellows, from the Oase Café. After the Programme, Exchange.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5,** Romanian Songs (on Gramophone Records). **11.30,** Radio Journal. **11.35,** Weather. **11.38,** Songs by Cossack Choirs (on Gramophone Records). **12.0 Noon,** Interval. **2.30 p.m.,** Economic Notes. **2.40,** Mezzo-Soprano Song Recital. **3.10,** Programme for Children, relayed from **Wilno, 533 kc/s, 563 metres.** **3.25,** Talk: Children's Letters. **3.40,** Answers to Correspondence. **3.55,** Light Music (on Gramophone Records). **4.5,** Violin Recital by Mme. Krongold: Sonata (Nardini); Poème (Chausson); Prayer (Händel); Sicilienne (Paradis); Caprice (Paganini-Kreisler). **4.50,** Answers to Agricultural Correspondence. **5.0,** Talk. **5.20,** Dance Music with Humorous Items. **6.5,** Miscellaneous Items. **6.25,** Reading. **6.40,** Programme Announcements. **6.45,** Radio Journal. **7.0,** Talk: The Publication of a Paper. **7.15,** Concert by the Society for Old Music, relayed from the Conservatoire; Conductor, Wilkomirski; Soloists, Szleminska (Soprano) and Drzewiecki (Pianoforte): Concerto for Violin and Pianoforte—Nova Casa (Jarzebsky); Concerto grosso in E Minor for Pianoforte and String Orchestra (Handel); Two Songs for Soprano with Orchestral and Pianoforte Accompaniment (Erlebach); Songs: (a) German Dance Song (Hassler), (b) Charm of Love (Chulz), (c) Pastorale and Serenade (Haydn); Pianoforte Concerto in E (Bach); Suite in G Minor for Pianoforte and String Orchestra (Telemann). **9.10,** Talk in Esperanto on Poland. **9.30,** Dance Music, relayed from the Oaza Dance Hall. In the interval, Aviation Weather Report and Police Notes.

WILNO

530 kc/s, 566 metres; 16 kW. **6.5 p.m.,** Lithuanian Review. **6.20,** Miscellaneous Items. **6.25,** See **Warsaw.** **6.40,** Programme Announcements. **6.45,** See **Warsaw.** **9.10,** Humorous Monologue. **9.25** till Close Down, Programme from **Warsaw.**

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—**6.20 p.m.,** Announcement and News. **6.50,** Introductory Talk to the Following Transmission. **7.0,** An Opera relayed from **Ljubljana.** In the intervals, News, Weather and Announcements. **10.0** (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender.**

THURSDAY
NOVEMBER THE NINTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes, Agricultural Notes and Weather. **7.20,** Gramophone Records of Yehudi Menuhin (Violin) and Paderewsky (Pianoforte). **7.45,** Lottery Results and News. **8.0,** Time. **8.2,** Talk: Strange Facts and Hobbies. **8.15,** News. **8.26,** Par la grace de Venus—Comedy in One Act (de Quirielle). **9.0,** Request Gramophone Music. **9.15,** Sketch. **9.30,** News. **9.35,** Request Gramophone Music (contd.). **9.50,** Dance Music. **9.55,** News. **10.0,** Concert of Oriental Music.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,137 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time, Weather, Stock Report and Gramophone Music. **6.0,** Programme for Children. **6.40,** News. **7.0,** French Lesson. **7.15,** Talk on Yugoslavia. **7.30,** Time Signal. **7.31,** The Station Orchestra. **8.0,** Relay of a Concert from the Town Hall, Enniscorthy. **9.0,** The Station Orchestra. **9.15,** Baritone Solos. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert of Musical Comedy Music. Selection from The Desert Song (Romberg); Song: A Bachelor Gay, from The Maid of the Mountains (Fraser-Simson); I've got to sing a Torch Song (Dubin); Song: Rose Marie (Harbach); Selection from Chu Chin Chow (Norton); Let's call it a Day (Brown); Duet: Indian Love Call (Friml); Selection from The Gipsy Princess (Kálmán). **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd. Light Music. Lucky Xylophone (Inns); Cuckoo Waltz (Jonasson); Song, Maire, My Girl (Casey); Festival March (Michael); A Yodelling Lullaby (Robinson); On the Beach at Waikiki (Traditional); Wee Macgregor Patrol (Amers). **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** J. MacGarvey, Entertainer. **11.0** (approx.), Close Down.

BARCELONA

EAJI, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Concert of Popular Music. In the interval: Talk. **7.0,** Request Gramophone Records. **7.30,** Exchange and Gramophone Records (contd.). **8.0,** Gramophone Music and News. **8.30,** Catalan Educational Programme: Geography and History Lesson. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5,** Concert by the Radio Orchestra. **10.0,** La Tragedia de Marichu—Comedy in Three Acts (Arniches). In the interval at **11.0,** News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Women. **3.58 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**4.55 p.m.,** Time and Programme Announcements. **5.0,** Concert by the Radio Orchestra. **5.38,** Popular Song Recital. **6.0,** Concert (contd.). **6.30,** Dance Music on Gramophone Records. **7.0,** Tchaikovsky Concert. Pianoforte Trio, Op. 50; Songs by Mme. Liza Popova; String Quartet in E Flat Minor, Op. 30. **9.0,** Time and News, followed by Dance Music from the Automobile Club.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**11.0 a.m.,** See **Munich. 2.0,** Orchestral Concert of Light Music, conducted by Eugen Sonntag: Four Old Dances (Niemann): (a) Eingang, (b) Sarabande, (c) Minuet, (d) Pavane; Elegie (Grieg); Frieden (Ehrenberg); Scherzo (Ehrenberg); Kleine Symphonie (Juon). In the interval at **2.15,** The Watchword. **3.0** (approx.), See **Heilsberg. 4.0,** A German Fairy Tale. **4.15,** Concert by the Fehse Quartet and Rudolf Watzke (Songs): Movements One and Two from the String Quartet in D Minor, Death and the Maiden (Schubert); Four Songs (Brahms). **5.0,** The Watchword. **5.5,** 1918-1923-1933—Some Pages of German History. **5.40,** A Dialogue. **5.50,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** See **Leipzig. 7.40,** See **Breslau. 8.10,** See **Stuttgart. 8.45,** See **Langenberg. 9.10,** News and Sports Notes. **9.40,** See **Berlin (Funkstunde). 10.20,** Hugo Kaun Quartet. **10.40,** See **Hamburg. 11.5,** See **Frankfurt. 11.35,** See **Heilsberg. 12 Midnight,** Close Down.

BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—11.0 a.m. to 2.0 p.m.,** See **Munich. 2.5,** Concert by the Berlin Station Orchestra and Choir; Conductors: Otto Frickhoeffer and Heinzkarl Weigel. **2.45,** Gramophone Records. **3.45,** The Watchword. **3.50,** Leonora Overture No. 3 (Beethoven), by the Berlin Station Orchestra, conducted by Otto Frickhoeffer. **4.10,** Propaganda Programme. **5.20,** Richtspruch—for Soloist, Choir, Orchestra, and Organ (Bernhard Homola): The Berlin Station Orchestra, conducted by the Composer, and the Berlin Choir conducted by Heinzkarl Weigel. **5.50,** The Watchword. **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** See **Leipzig. 7.40,** See **Breslau. 8.10,** See **Stuttgart. 8.45,** See **Langenberg. 9.10,** News. **9.40,** Pianoforte Quartet in C Minor, Op. 60 (Brahms). **10.20,** See **Berlin (Deutschlandsender). 10.40,** See **Hamburg. 11.5,** See **Frankfurt. 11.35,** See **Heilsberg. 12 Midnight,** Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News and Racing Results. **7.40,** Talk arranged by the International Labour Bureau. **8.0,** Talk on Wine. **8.15,** News. **8.30,** Un Fils d'Amérique—Comedy in Four Acts (Pierre Veber and Marcel Gerbidon).

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**5.5 p.m.,** Concert by the Station Band, conducted by Nägl. **5.35,** A Travelogue. **5.50,** Gramophone Music. **5.55,** Talk for Housewives. **6.0,** See **Prague. 6.10,** Talk from **Kosice, 1,022 kc/s, 293 metres. 6.25,** See **Prague. 8.0,** See **Brno. 9.0,** See **Prague. 10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—11.0 a.m. to 2.0 p.m.,** See **Munich. 2.0,** Concert by the Station Orchestra, conducted by Rischka. In an interval from **2.45 to 2.50,** Talk: The Watchword. **3.50,** A Review of Events—Literary and Musical Programme. **4.50,** Talk: The Watchword. **4.55,** Music and Literature of the Germans. **5.25,** Reading: Der Weg durch die Hölle (Rolf Brandt). **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** See **Leipzig. 7.40,** The Heroic Song. **8.10,** See **Stuttgart. 8.45,** See **Langenberg. 9.10,** News. **9.40,** See **Berlin (Funkstunde). 10.20,** See **Berlin (Deutschlandsender). 10.40,** See **Hamburg. 11.5,** See **Frankfurt. 11.35,** See **Heilsberg. 12 Midnight,** Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.0 p.m.,** Ten Legends, Op. 59 (Dvorak), by the Station Orchestra, conducted by Janota. **3.50,** See **Prague. 4.15,** News for Young People. **4.25,** See **Prague. 4.50,** Gramophone Music. **5.0,** Theatre and Film Review. **5.15,** See **Prague. 5.25,** German Transmission: News and a Comedy (Gisely), with Music by Bruckmüller. **6.0,** See **Prague. 7.20,** Russian Sacred Music, relayed from St. Wenceslas Church. **7.45,** See **Prague. 8.0,** Concert by the Station Orchestra: Introduction to Act III of The Devil and Kate (Dvorak); A Tale, Op. 16 (Suk); Selection from a Ballet Pantomime (Nedbal); Selection from Czar Sultan (Rimsky-Korsakov); Two Dances from The Sleeping Beauty (Tchaikovsky). **9.0,** See **Prague. 10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans. **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert. **5.0,** The French Revolution—Concert by the Symphony Orchestra, conducted by Arthur Meulemans: Overture, Maximilian Robespierre (Litolff); Marche lugubre (Gossec); Peuple, éveille toi (Gossec); Overture, Charlotte Corday (Benoit). **5.30,** Programme for Children. **6.0,** Talk. **6.15,** Gramophone Concert. **7.15,** Talk for Workers. **7.30,** Sports Notes. **8.0,** Concert by the Radio Orchestra, conducted by Franz André: March, Birds of Passage (Kontek-Potusnik); Selection from Siberia (Giordano); Vibraphone Solo, Where my Carvan has rested (Löhr); Selection from Malbruck s'en va-t-en guerre (Auric); Polonaise in A for Violin (Wieniavsky); Spanish Songs (Albéniz); Jazz Divertissement (Brusselmans); English Scenes (Bantock). **8.45,** Political Talk. **9.0,** Concert by the Symphony Orchestra, conducted by Arthur Meulemans: Overture, La Poupée (Audran); Potpourri, Offenbachiana (Conradi); Selection from Ciboulette (Hahn); Selection from The Gipsy Princess (Kálmán); Piece (Salabert); Overture, Boccaccio (Suppé). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—**12 Noon,** Gramophone Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans. Kleiner Wiener Marsch (Kreisler); Overture, The Barber of Seville (Rossini); Liebestraum (Liszt); Negro Cradle Song (Clutsam); Serenata (Toselli); Waltz, Tales from the Vienna Woods (Joh. Strauss); Gramophone Record: Songs by Caruso; Selection from The Merry Widow (Lehár). **5.0,** Orchestral Concert by the Radio Orchestra, conducted by Franz André. En partant du pied gauche (Aveau); Waltz, España (Waldteufel); Overture, Fra Diavolo (Auber); Waltz Potpourri (Robrecht); Selection from Rose Marie (Friml). **5.45,** Programme for Children. **6.30,** Music by the Small Station Orchestra, conducted by Leemans. Overture, Tancred (Rossini); Piece (Kálmán); Lehár Potpourri (Bruby). **6.50,** Soloist Concert. Denise Gillis (Violin), Simonne Van Maldegem (Pianoforte). Armand De Buck (Songs), and Albert de Grave (Recitations). Violin Solo. Polonaise brillante (Wieniawsky); Aria from Franciskus (Tinel); Pianoforte Solos: (a) Etude in E (Chopin), (b) Ballade in G Minor (Chopin); Recitations. **7.30,** Talk for Housewives. **8.0,** Concert dedicated to Peace. The Symphony Orchestra, conducted by Arthur Meulemans. Soloist: Georges Vexler (Songs to the Balalaika and Guitar); Festival March (Busser); Second Movement from the Pastoral Symphony (Beethoven); Interlude by the Pogen Society; Songs, La pacification de Gand (Benoit). **8.45,** Talk: Who will bring us Peace? **9.0,** Concert (contd.). Waltz, The Blue Danube (Joh. Strauss); Largo (Handel); Interlude by the Pogen Society; Gramophone Record: Finale from the Ninth Symphony (Beethoven); Serenata (Toselli); Salut d'amour (Elgar); Songs, Rubens marche (Benoit). **9.50,** Evening Prayer. **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Variety Music by the Dinico Orchestra. In an interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.40,** Aida—Opera in Four Acts (Verdi), on Gramophone Records. In the intervals, Reading and Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **7.40 p.m.** till Close Down.—**4.30 p.m.,** Concert by the Opera House Orchestra, conducted by Johann Ferenczsik. **5.50,** Programme for Workers. **6.20,** Violin and Pianoforte Recital. **7.0,** A Comedy. **9.0,** News. **9.15** (approx.), Concert by a Cigány Band from the Café Patria. Soloist: Julius Szantho (Hungarian Folk Songs).

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY, 31.51 metres. 11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.2,** Concert by the Leonard Guldmark String Ensemble, relayed from Bellevue Strandhotel. **1.0 p.m.,** Interval. **1.45,** Jazz Music by Otto Lington and his Band. In an interval at **2.30** (approx.), Reading (Falk-Rönne). **3.45,** Programme for Boys. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: An Egyptian Village Wedding. **5.15,** Elementary English Lesson. **5.45,** Weather. **6.0,** News. **6.15,** Time Signal. **6.16,** Talk: The Art of Illustrations. **6.45,** Danish Lesson. **7.10,** Concert by the Radio Symphony Orchestra, the Radio Choir and Soloists, relayed from the State Broadcasting Building. Conductor: Georg Höeberg. Overture, William Shakespeare (Kuhlau); Andante and Finale from the Violin Concerto (Lange-Müller); Contata for Choir, Soloists and Orchestra: Erl King's Daughter (Gade). Interval. Symphony L'Inestinguibile, Op. 29 (Nielsen). **9.15,** News. **9.30,** Reading (H. G. Wells), translated by Gudrun Lohse. **9.50,** Dance Music by the Erik Tuxen Band, relayed from the Palace Hotel. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

RADIO NORMANDIE, 1,328 kc/s, 225.9 metres; 10 kW.—**10.30 to 11.30 a.m.,** Programme in English by the I.B.C. Happy Hour. Part I—Orchestral Concert: Signature Tune; A Birthday Serenade (Lincke); Her First Dance (Heykens); Xylophone Solo: Dance d'Hesoin (Abbey); Song: Glass of Golden Bubbles (Strauss-Herbert); Waltz from A Waltz Dream (O. Straus); Xylophone Solo: Dance of the Marionette (Gaston); Ay, Ay, Ay (Freire); She's Ever body's Sweetheart Now (Hargreaves). Pa II—Dance Music: Egypt; Wood Violets Shadows on the Swanee; Reflections in t Water; Lay your Head on my Shoulde Cecilia Mia; I always keep my girl o late; Let's call it a Day; Signature Tun **11.30,** French Programme. **4.30 to 6.0 p.m** Programme in English by the I.B.C. **4.3** I.B.C. Nursery Corner. **5.0,** Organ Recit. for Worthing and Littlehampton Listener Signature Tune, The Night by the Sea Potted Overtures (Engleman); Sweet an Low (Barnby); Caprice viennois (Kreisler) Song: Tired Hands (Sanderson); Serena (Drigo); Träumerei (Schumann); My Moo light Madonna (Fibich); Trees (Rasbach **5.30,** Accordion Band Music for Brighto and Hove Listeners: The Old Rustic Bridg by the Mill (arr. Woods); My Darlin (Meyer); One little Word led to anothe (Jones); A Good Old Irish Stew; L Javanette (Bozi); Signature Tune. **5.4** Concert of Dance Music: My Kingdom fo a Smile from you; Cecilia Mia; Dinner a Eight; Goodnight, little Girl of my Dream **6.0,** French Programme. **10.0** (approx.) ti Close Down. Programme in English by t I.B.C. **10.0,** Dance Music: Signature Tun Bells of Normandy; Lazybones; Tick, Tock Lover; My Own; Mia Amor esta en el Valle The Last Round Up; Dinner at Eight; Wha a Perfect Combination; Morning. Noon an Night; My Moonlight Madonna; Oh Johanna; A Girl like Nina; Lay your Hea on my Sholder; The Wedding of Mr. Micke Mouse; Snowball; Sing another Line; Si nature Tune. **11.0,** Tunes from the Talkies Signature Tune, Sittin' in the Dark; Whoopee Medley; Heaven will protect an Honest Girl; Sweetheart Darlin'; Song: Pretty Ol (Strauss); Mrs. Bartholomew; A Glass Golden Bubbles; There's Magic in the Air Smilin' through; Signature Tune. **11.3** Concert by the I.B.C. (Ireland), Ltd.: Signature Tune, Come back to Erin; The Enchanted Forest (Ganglberger); I do like t be beside the Seaside (Glover); The Londonderry Air (Traditional); Waltz, Très jol (Waldteufel); Song: Throw open wide yo Window, Dear (Calson); Perdita (Cuvelier) Sicilian Serenade (Schmalstich); Wiene blut (Joh. Strauss); Signature Tune, Com back to Erin. **12.5 a.m. (Friday),** I.B.C Late News Bulletin in English. **12.1** (approx.), Club Concert for Wemyss an Dumbarton Listeners: Signature Tune, Th Chum Song; When work is through (Shemann); Beautiful Lady (Caryll); Tea fo Two (Youmans); Jealousy (Gade); Fiddlin Joe (Cavanagh); Don't blame me (Fields) 'Twixt the Devil and the Deep Blue Se (Eyton); My Kingdom for a smile from yo (King); Trouble in Paradise (Wever); I've got to pass your house (Brown); Cecili Mia (Frontela); Look what you've don (Kalmar); Ding, Dong, Ding (Hargreaves) Signature Tune. **1.0,** Dance Music: Signature Tune, The Bells of Normandy; Isn't thi a Night for Love?; I'll take an option o you; Sweet Dreams, Pretty Lady; Under Blanket of Blue; At the Old Pig an Whistle; Spanish Eyes; Bugle Call Rag; M Wishing Song; Lover's Lane; Cornflowers an Poppies; Egypt; Shadows on the Swanee Solitario; I've told every little Star; Mar Rose; Whistling under the Moon; Signature Tune. **2.0,** I.B.C. Goodnight Melod and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed b **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—11.0 a.m. to 2.0 p.m.,** See **Munich. 2.3** Weather. **2.40,** Time and Exchange. **3.** See **Stuttgart. 4.0** (approx.) **to 6.0,** Se **Langenberg. 6.0,** Transmission for all Ger man Stations, relayed from **Munich. 7.0,** Se **Leipzig. 7.40,** See **Breslau. 8.10,** See **Stuttgart. 8.45,** See **Langenberg. 9.10** (approx. News. **9.40,** See **Berlin (Funkstunde). 10.2** See **Berlin (Deutschlandsender). 10.40,** Se **Hamburg. 11.5,** Concert of Lortzing Oper Music. **11.35,** See **Heilsberg. 12 Midnight** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m.,** Transmission for all German Stations, relayed from **Munich. 7.0,** See **Leipzig. 7.40,** See **Breslau. 8.10,** See **Stuttgart. 8.45,** See **Langenberg. 9.10** (approx.), News. **9.40**

See **Berlin (Funkstunde).** 10.20, See **Berlin (Funkstunde).** 10.40, Wanderer Fantasia (Schubert). 11.5, See **Frankfurt.** 11.35, See **Heilsberg.** 12 **Midnight,** Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc s, 447.1 metres.—11.0 a.m.,** (approx.) **to 2.0 p.m.,** See **Munich.** 2.0, Agricultural Prices and Exchange. 2.30, Talk. 2.35, An Englishman and a German discuss an East Prussian Labour Service Camp. 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken. In the interval at 4.0, Book Review. 4.40, Talk. 4.55, Elementary English Lesson. 5.15, Agricultural Prices. 5.20, Talk. 5.25, Agricultural Talk. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from **Munich.** 7.0, See **Leipzig.** 7.40, See **Breslau.** 8.10, See **Stuttgart.** 8.45, See **Langenberg.** 9.10, News and Sports Notes. 9.40, See **Berlin (Funkstunde).** 10.20, See **Berlin (Deutschlandsender).** 10.40, See **Hamburg.** 11.5, See **Frankfurt.** 11.35, East Prussian Songs. 12 **Midnight,** Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to **5.40 p.m.,** and 20 kW from **5.40 p.m.** Programme of the General Broadcasting Society (A.V.R.O.). **11.40 a.m.,** Time Signal. **11.41,** Concert by the Station Orchestra, conducted by Nico Treep: Miniature Overture, The Merrymakers (Coates); Suite, In a Fairy Realm (Ketelbey); Selection from Tannhäuser (Wagner); Waltz from Eugen Onegin (Tchaikovsky); Gramophone Records; Soldiers in the Park (Monckton); Selection from The Maid of the Black Forest (Jessel); Waltz, Love and Spring (Waldteufel); Minuet (Paderevski); My Serenade (Staffelli); Gramophone Records; Selection from Viktoria and her Hussar (Abraham); Nights in Cairo (Gilbert); Tango, La Argentina (Nieland); Berceuse de Jocelyn (Godard); Radetzky March (Joh. Strauss). **1.55,** Interval. **2.10,** Concert (contd.): Overture, The Magic Flute (Mozart); Selection from Die toten Augen (d'Albert); Polonaise from Eugen Onegin (Tchaikovsky). **2.40,** Dressmaking Lesson. **3.25** (approx.), Gramophone Music. **3.40,** Talk for Hospitals. **4.10,** Pianoforte Recital by van Rooy: Sonata in A Flat, Op. 26 (Beethoven); Rhapsody in G Minor (Brahms). **4.40,** A Radio Play for Children. **5.10,** Concert of Light Music by Kovac Lajos and his Orchestra. In the interval at **6.10,** Talk on Sports. **7.10,** English Lesson. **7.40,** Time. **7.41,** News. **7.45,** Concert by the Concertgebouw Orchestra, conducted by Eduard van Beinum, relayed from the Concertgebouw, Amsterdam. Soloists: Jo. Vincent (Soprano) and Marie-Louise Marechal (Pianoforte): Leonora Overture, No. 3 (Beethoven); Pianoforte Concerto, No. 1 (Mendelssohn); Gramophone Records; Fourth Symphony in G (Mahler). **10.10,** Gramophone Records. **10.40,** News. **10.50,** Dance Music by Tom van der Stap's Band, relayed from the Pschorr Dance Hall, Rotterdam. **11.40,** Time and Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW from **3.40 p.m.—11.55 a.m. to 1.40 p.m.,** Programme of the Catholic Radio Society (K.R.O.). **11.55,** Concert by the K.R.O. Orchestra, conducted by 't Wond: Melody (Siede); Overture, Erlenhügel (Kühlau); Brahms Potpourri (Morena); Irish Tune from County Derry (Grainger); Eine kleine Liebelei (Lautenschläger); Festival Overture (Leutner); Happy End (Noack); Gramophone Music; Sang und Klang aus dem Osten (Eberle); Marien-Walzer (Bayer); The Singing Stream (Carr); Parade des embonpoints (Aubert); Indian Canzonetta (Dvorák); Blumenkorso (Siede). **1.40** till Close Down. Programme of the Christian Radio Society (N.C.R.V.). **1.40,** Handicraft Lesson. **2.40,** Gramophone Music. **3.10,** Interval. **3.40,** Religious Programme. **4.40,** Handwork Lesson for Young People. **5.10,** Concert of Chamber Music by v. d. Hurk (Flute and Piccolo) and Visser (Organ): Concerto, Op. 13, Murillo (Tertschak); Marche pontificale (Lemmens); Bénédiction nuptiale (Saint-Saëns); Concerto, Op. 107 (Chaminade); Gramophone Music; Idylle (Godard); Five Pieces (Leemens): (a) Invocation, (b) Cantabile, (c) Mélodie facile, (d) Hélène Polka, (e) Fanfare; Dance of the Satyrs (le Tiers); Rêverie du soir (Rickman); Bravour Polka (Wetzger). **6.10,** Gramophone Music. **6.40,** Police Report. **6.55,** Talk. **7.10,** Press Review. **7.40,** Concert by Johez Male Voice Choir, conducted by Scheffer. **8.40,** Talk for Parents. **9.10,** Concert by the Hartvelt String Quartet: Quartet No. 14 in E Sharp (Mozart); Quartet in B Sharp, Op. 18, No. 6 (Beethoven). In an interval at **9.35,** News. **10.10,** Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results and News. **8.10,** Scientific Review. **8.20,** Light Music. **8.45,** News and Weather. **9.0,** Variety Concert.

KALUNDBORG.—See **Copenhagen.**

KATOWICE

734 kc s, 408 metres; 16 kW.—**6.10 p.m.,** Sports Talk. 6.25 till Close Down, See **Warsaw.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LAHTI

167 kc s, 1,796 metres; 10 kW. Relayed by **Helsinki, 815 kc s, 368.1 metres.—4.0 p.m.,** Concert by the Station Orchestra, conducted by Erkki Linko: March (Fucik); Melody (Czibulka); Overture, The Bohemian Girl (Balfe); Selection from Eine Frau von Format (Krauss); Evening Song (Aro); Romanian Dances (Bartok); Bolero (Nicodé). **5.15,** Talk. **5.40,** Talk. **6.5,** Pianoforte Recital by Kaire Halava: Three Sonatas (Scarlatti), Elegy and Poem (Sundblad-Halme); Pieces (Pylnugren). **6.30,** A Play (Robert Kiljander). **7.10,** Concert by the Radio Orchestra: Overture, Le Fils du Mandarin (Cui); Legend (Dvorak); Waltz (Roinila); Grotesque (Franklyn); African Dance (Ganne). **7.45,** News in Finnish. **8.0,** News in Swedish.

LANGENBERG

635 kc/s, 473 metres; 60 kW. **11.0 a.m. to 2.0 p.m.,** See **Munich.** 2.0, Concert Relay (to be announced). 2.55, Talk: The Watchword. **3.0,** See **Stuttgart.** 4.0, Talk: The Watchword. **4.5,** Concert by the Station Orchestra and Chamber Choir, conducted by Dr. Wilhelm Buschkötter: Requiem for Contralto, Mixed Choir, and Orchestra (Reger); Mahnruf der Toten—Poem for the Radio (Jakob Kneip), for Speaker and Organ; Symphony No. 5 in B flat (Anton Bruckner). **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** See **Leipzig. 7.40,** See **Breslau. 8.10,** See **Stuttgart. 8.45,** Concert by the Cologne Male Voice Choir, conducted by Prof. Trunk: Du mein Deutschland (Trunk); German Folk Songs: (a) Der gute Kamerad (Silcher), (b) Lützows wilde Jagd (Weber). **9.10,** News. **9.40,** See **Berlin (Funkstunde). 10.20,** See **Berlin (Deutschlandsender). 10.40,** See **Hamburg. 11.5,** See **Frankfurt. 11.35,** See **Heilsberg. 12 Midnight,** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc s, 319 metres.—11.0 a.m. to 2.0 p.m.,** See **Munich.** 2.0, Film Review. 2.30, The Watchword. 2.35, Market Prices. **3.0,** See **Heilsberg.** 4.30, Talk: As a Prisoner in the Fortress of Landsberg in 1923. **5.0,** An Interview with the Fleming Godfried Rooms. **5.10,** Songs of all Lands, on Gramophone Records. **5.40,** The Watchword. **5.45,** Exchange, and Review of the Day. **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** The Fifth Symphony (Beethoven). **7.40,** See **Breslau. 8.10,** See **Stuttgart. 8.45,** See **Langenberg. 9.10** (approx.), News and Sports Notes. **9.40,** See **Berlin (Funkstunde). 10.20,** See **Berlin (Deutschlandsender). 10.40,** See **Hamburg. 11.5,** See **Frankfurt. 11.35,** See **Heilsberg. 12 Midnight,** Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc s, 574.7 metres; 7 kW.—**5.0 p.m.,** Talk for Peasants. **5.30,** The Letter Box. **6.0,** Serbo-Croat Lesson. **6.30,** Request Gramophone Music. **7.0,** Waltz Music by the Station Orchestra. **7.30,** Trio Concert. **8.0,** Pianoforte and Harmonium Duets. **8.30,** Weather and News. **9.0,** Concert by the Station Orchestra.

LUXEMBOURG

252 kc s, 1,191 metres; 200 kW. German Evening. **7.0 p.m.,** Violin Sonata in D Minor (Bach), on Gramophone Records. **7.30,** Songs from Die schöne Müllerin (Schubert), by Herman Fleischmann (Baritone). **8.0,** Humorous Programme in German. **8.10,** Racing Results and Weather. **8.20,** News in French. **8.30,** The Land of Smiles—Operetta in Three Acts (Lehar), relayed from the Municipal Theatre. In the intervals, Sports Notes and News in German.

LWOW

788 kc s, 381 metres; 16 kW.—**6.5 p.m.,** Gramophone Music. **6.15,** Announcements. **6.25,** See **Warsaw. 6.40,** Programme Announcements. **7.0** till Close Down, See **Warsaw. 10.30** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Popular Music by the Pierre Lorraine Quintet. **9.0,** Concert. Darmencier (Songs), Cécile Desgeorge (Harp), Mme. Gaillard (Violin), and Mlle. Boisson (Pianoforte): Oschenmenuett (Haydn); Au petit jour du matin (Doret); Il était un cœur volant (Doret); Chanson pour la reine des Bois (Doret); Andantino (Martini); Lolita la danseuse (Tournier); Two Eighteenth Century Songs (Trillat); Berceuse (Fauré); Melody (Bruch); Contemplation (Renié); Turkish March (Beethoven). After the Concert, Music by the Pierre Lorraine Quintet (contd.), followed by News Bulletin.

MADRID

ARANJUEZ (EAQ), 10,000 kc s, 30 metres; 20 kW.—**10.30 p.m.,** Programme relayed from **Madrid (EAJ7). 12 Midnight** till Close Down, Programme in English by the I.B.C. Light Music; Rosa del Rio (Alexander); A Song, a Kiss, a Girl (Gilbert); Secrets (Discepolo); I love you (Canaro); On a Little Street in Honolulu (Sherman); Montana Moon (Freed); Capulito de Alheli (Leonora); Butterflies in the Rain (Myers). **12.30 a.m. (Friday),** Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Announcements, and Programme for Children. **8.15,** Topical Review. **8.30 to 9.15,** Interval. **9.15,** English Lesson. **9.30,** Chimes, Time and Topical Review. **9.45** (approx.), Dramatic Programme. **11.45,** Topical Review. **12 Midnight,** Chimes. **1.0 a.m. (Friday)** till Close Down, Programme in English by the I.B.C. Dance Music; It's not a Secret any more; Scot in Exile; Louisville Lady; Blue Cloud;

IN THE TITLE ROLE. Signorina Giamina Pederzini, soprano, who takes the leading part in "La Bella Elène," the Offenbach opera relayed this evening by Turin and Milan from the Teatro dell'Argentina, Rome.

Heaven will protect an Honest Girl; Love's Old Sweet Song; Whistling under the Moon; Lover's Lane; Selection from A Bedtime Story; I've got to pass your House; Mademoiselle; My Mother's Garden; I've found the Right Girl; Lay your Head on my Shoulder; Wood Violets; Sing another Line. **2.0,** I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.30 p.m.,** German Transmission: Theme with Variations, in C Minor (Beethoven), by Camilla Brandeis (Pianoforte). **6.0,** See **Prague. 8.0,** See **Brno. 9.0,** See **Prague. 10.0** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.—10.45 a.m.,** Weather. **1.45 p.m.,** Weather. **2.0,** Tchaikovsky Concert, with Introductory Talk and Readings: Second and Third Movements from the Violin Concerto; Three Arias from Eugene Onegin. **3.0,** German Lesson. **4.30,** Talk on Science. **5.30,** Pianoforte and Song Recital, with Dramatic Items by Kachalov. **8.0,** News. **8.30,** Programme Announcements. **8.55,** Chimes. **9.5,** Press Review. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc s, 533 metres; 60 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—11.0 a.m.,** November 9th, 1923—March from the Bürgerbraukeller to the Feldherrnhalle, with Hitler at the Head of the Procession. At the Feldherrnhalle Hitler takes the Salute. **12.20 p.m.,** The Bavarian Minister confers on Hitler the Freedom of the City. **12.30,** Address by Hitler, followed by the Unveiling of the Monument at the Feldherrnhalle, by the Reichskanzler. **2.0,** The Watchword. **2.5,** The Swearing in of the Bavarian Burgermasters. **2.40,** Concert by the Station Chamber Choir, conducted by Prof. Zengerle; Soloist: Gustav Schoedel (Organ): Fantasia and Fugue in G Minor (Bach); Songs for Choir and Organ: (a) Hymne (Suder), (b) Gebet (Rüdinger); Organ Solo, Te deum (Reger); Lobet den Herrn—Motet for Mixed Choir and Organ (Bach). **3.20,** Talk. **3.40,** Concert by the Small Station Orchestra, conducted by Erich Kloss: Overture, Lucio Silla (Mozart); Andante from the Pianoforte Trio in B flat (Schubert); Selection from Ariadne auf Naxos (Richard Strauss); Tränme (Wagner); Suite from Music by Brahms (Fritz); Abendlied and Träumerei (Schumann); Serenade from the String Quartet (Haydn); Barcarolle (Reuss). **5.0,** The Watchword. **5.5,** Recital of Songs by Max Hartmann (Baritone); Heliopolis (Schubert); Abendlied (Schumann); Wenn ich mit Menschen und mit Engelszungen redete (Brahms); Wächterlied auf der Wartburg (Wolf); Der Weckruf (Pfitzner). **5.25,** Talk. **5.50,** Announcements. **6.0,** Transmission for all German Stations: November, 1923—Radio Play (Dietrich Loder). **7.0,** See **Leipzig. 7.40,** See **Breslau. 8.10,** See **Stuttgart. 8.45,** See **Langenberg. 9.40,** See **Berlin (Funkstunde). 10.20,** See **Berlin (Deutschlandsender). 10.40,** See **Hamburg. 11.5,** See **Frankfurt. 11.35,** See **Heilsberg. 12 Midnight,** Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc s, 574.7 metres; Notodden, 671 kc s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres;** and **Rjukan, 671 kc s, 447.1 metres;** and **Jeløy, LCL** (See Short-Wave List).—**4.0 p.m.,** Gramophone Concert. **5.0,** German Lesson. **5.30,** Divine Service. **6.0,** Announcements, Weather and News. **6.30,** Violin Recital by Gunnar Knudsen: Sicilienne and Rigaudon (Francœur-Kreisler); Liebesfreud (Kriesler); Liebesleid (Kreisler); Ballet Music from Rosamund (Schubert-Kreisler); Caprice viennois (Kreisler); Spanish Dance (Granados-Kreisler); Tambourin chinois (Kreisler); Spanish Dance (Falla-Kreisler). **7.0,** Time Signal. **7.1,** Veterinary Talk. **7.30,** Recital of Swedish Songs and Popular Melodies. **8.0,** Recitations. **8.20,** Popular Programme. **8.40,** Announcements and News. **9.0,** Topical Talk. **9.15,** Sea Shanties by Magnus Samuelson, accompanied by the Lind Trio, relayed from **Stavanger, 1,247 kc s (240.6 metres). 9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.30,** Gramophone Concert, Part I, Extracts from Cavalleria rusticana (Mascagni). **8.0,** Talk on Home Affairs. **8.15,** Concert (contd.). Part II: Selection from The Thieving Magpie (Rossini); Ballet egyptien (Luigini); Histoire d'enfants (Boeck); La cherchense de clair de lune (Saint-Servan); Cœur de Patrie (Saint-Servan); Waltz (Liebmann); Two Melodies (Gray); Prenez garde, Messieurs (Kaiser); Les échos champêtres (Vivey); Hunting Horn Music. **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW. **7.0 p.m.,** Hahn Music on Gramophone Records. **7.5,** Agricultural Notes. **7.15,** Le Journal Parlé. **7.30,** Programme for Children. **8.0,** Sponsored Talk. **8.5,** Sponsored Topical Talk. **8.40,** Hawaiian Guitar Music by the Rose Cornaz Ensemble. **9.0,** Fashion Talk. **9.20,** Sponsored Programme Concert. **10.30,** News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** Press Review and Weather. **12 Noon,** Protestant Address. **12.30 p.m.,** Gramophone Records. Part I: Cesar Franck Music. First Movement from

the Violin and Pianoforte Sonata; La Procession; Extract from Les béatitudes; Symphonic Poem, Psyche. Part II: Extracts from Classical Dramas; Two Scenes from Le Cid (Corneille); Two Scenes from Polyeucte (Corneille); Scene 8 from Act 3 of Andromaque (Racine); Scene 5 from Act 2 of Bérenice (Racine); Monologue from L'avare (Molière); Extracts from Tartuffe (Molière). Part III: Light Music. Musical Follies (Betove); Pianoforte (Four Hands); Memories of Bayreuth (Fauré-Messager); Rhythmic Fantasia on Themes from Carmen (Bizet). In the Intervals at 1.0, Exchange and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Market Prices. 6.20, Agricultural Talk: The Making of an Orchard. 6.45, Legal Talk. The Protection of the Insane. 7.0, Radio Dialogue. 7.20, Gramophone Music Trink-Trank (Bendix); Songs of the Hebrides (Kennedy-Fraser); Yvonne (Loyraux); La femme qu'on aime (Leardy-Gabriello); Phonomanie (Avignon). 7.45, Review of the German Press. 8.0, Concert by the Kolisch String Quartet. 8.30, News and Weather. 8.40, Review by Dominique Bonnaud. 8.45, O mon bel inconnu—Musical Comedy in Three Acts (Hahn), after the Play by Sacha Guitry, relayed from the Théâtre Bouffes-Parisiens. In the interval at 9.15, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.—7.0 p.m.,** Musical Originalities, from **New York. 7.30, KDKA** Home Forum. **7.45,** Pioneers, **KDKA** to New York. **8.0,** Programme to be announced. **8.15,** Words and Music, from **New York. 8.45,** Federation of Pennsylvania Women. **9.0,** Betty and Bob, from **New York. 9.15,** Programme to be announced. **9.30,** News and Markets. **9.45,** Thursday Special, from **New York. 10.0,** Federation Women's Club, from **New York. 10.15,** KDKA Kiddies' Klub. **10.30,** Singing Lady, from **New York. 10.45,** Orphan Annie, from **New York. 11.0,** News, Pat Haley. **11.15,** Sports, Programme Preview. **11.30,** Evensong. **11.45,** Lowell Thomas, from **New York. 12 Midnight,** Amos 'n' Andy, from **New York. 12.15 a.m. (Friday),** Marvellous Melodies. **12.30,** Lois Miller, Organist. **12.45,** Pathé News of the Air. **1.0 to 3.30, New York** Relay. **1.0,** Captain Diamond. **1.30,** Adventures in Health. **1.45,** Crooning Choir. **2.0,** Death Valley Days. **2.30,** Lady Esther Serenade. **3.0,** Hands across the Border.

PORSGRUND.—See **Oslo.**

POZNAN

POLSKIE RADIO; 897 kc/s, 334.4 metres; 1.5 kW.—**6.5 p.m.,** Miscellaneous Items. **6.25,** See **Warsaw. 6.40,** Programme Announcements. **6.45,** Programme from **Warsaw. 9.0,** Time and Sports Notes. **9.10,** Dance Music from the Polonia Café. In the interval at **10.0,** Aviation Weather Report and Police Notes from **Warsaw.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Brno. 3.50,** Programme for Children. **4.15,** Talk on Economics. **4.25,** Gramophone Music. **4.35,** French Lesson. **4.50,** Gramophone Music. **5.5,** Agricultural Report. **5.15,** Talk for Workers. **5.25,** News in German. **5.30,** German Transmission: Agricultural Report. **6.0,** Time and News. **6.10,** Talk from **Kosice, 1,022 kc/s, 293 metres. 6.25,** Military Band Concert. **7.20,** Chopin Pianoforte Recital by Niedzielski: Mazurka in B Minor; Nocturne in C Sharp Minor; Scherzo in B Minor. **7.45,** Recitations. **8.0,** Concert by the Station Orchestra, conducted by Jeremias; Soloist, Eva Hadrabova-Nedbalova. **9.0,** Time and News. **9.15,** Talk in Czech, German and French on the following Transmission. **9.25,** Smetana Concert by the Male Voice Choir of the Smetana Choral Society, conducted by Spilka; Song, The Renegade; The Farmer; Dedication; The Three Horsemen; Our Song; Song at Sea. **10.0** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres, 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.—6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Geneva**), Variety Items. **12 Noon** (from **Lausanne**), Financial Notes. **12.10 p.m.** (from **Lausanne**), Gramophone Concert. **1.0 to 2.58,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0** (from **Geneva**), Gramophone Concert. **5.0** (from **Lausanne**), Talk on Saddlery. **5.30** (from **Lausanne**), Sports Talk. **5.55** (from **Lausanne**), Tourist Report. **6.5** (from **Lausanne**), Theatre Talk. **6.30** (from **Lausanne**), Agricultural Talk. **6.59** (from **Lausanne**), Weather Report. **7.0** (from **Lausanne**), Chamber Music by the Lausanne Trio: Trio in C Minor, Op. 101 (Brahms); Trio in D (Boieldieu). **7.40** (from **Lausanne**), Talk: The Art of Oratory. **8.0** (from **Lausanne**), A Cabaret Concert by René Bersin and Company. **9.0,** News and Weather. **9.10** (approx.), Close Down.

NOV. 9th THURSDAY *continued*

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**11.0 a.m.,** Weather. **1.15 p.m.,** Light Music. **5.0,** Weather. **8.5,** Musical Programme. **8.30,** Weather. **8.40,** Musical Programme and Announcements. **9.0,** Chimes and News. **9.30,** Reading. **10.0,** Concert by the Radio Trio, followed by Arias on Gramophone Records.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**6.5** Symphony Concert, conducted by von Hoesslin, relayed from the Opera House; Symphony No. 4 (Brückner); Variations and Fugue on a Theme of Mozart, Op. 132 (Reger). In the interval at **7.10,** News. **8.0,** Weather and News. **8.15,** Concert by the Y.M.C.A. Orchestra. **9.0** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.;** and **2RO** (see Short Wave List).—**11.30 a.m.,** Gramophone Music. **12 Noon,** Humorous Programme. **12.10 p.m.,** Orchestral Concert relayed from **Turin.** In the intervals at **12.30,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.50,** Giornale Radio and Exchange. **4.0,** Reading. **4.10,** Weather. **4.15 to 5.0,** Violin and Song Recital by Luisa Carlevarini and Nadia Krusceva (Soprano). Violin Solos: (a) Gavotte (Gossec), (b) Fête villageoise (Gossec), (c) Tempo di danza (Viotti); Three Bulgarian Songs (Cristov); Violin Solos: (a) Irlandaise. (Shelling-Kreisler), (b) Melody (Gershwin), (c) La caccia (De Giardini-Moffat); Two Bulgarian Songs. **5.40** (Naples), Shipping and Sports Notes. **5.45,** Dopolavoro Announcements and Tourist Report. **6.10,** Agricultural Notes and Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time and Announcements. **7.15,** Gramophone Music. **7.30,** Giornale Radio and Sports Notes. **7.45,** Military Band Concert. In the intervals, Dialogue and Theatre Review. **10.0,** Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW.—Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.—12.45 a.m. (Friday),** Stock Reports. **1.0** Rudy Vallee's Orchestra from **New York. 2.0,** Captain Henry's Show Boat—Orchestral Programme with Soloists, from **New York. 3.0,** Al Jolson and Paul Whiteman's Orchestra from **New York. 4.0,** Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **11.0** (from **Zürich**), Light Orchestral Music. **12.25 p.m.** (from **Zürich**). Time, Weather and Exchange. **12.30** (approx.) to **2.30,** Interval. **2.30** (from **Zürich**), Concert by the Small Station Orchestra, conducted by Scherbaum. **3.0,** See **Radio Suisse-Romande. 5.0** (from **Basle**), Gramophone Music. **5.30** (from **Basle**), Talk on Negro Spirituals. **6.0** (from **Basle**), Time, Weather and Traffic Report. **6.5** (from **Basle**), Review of New Gramophone Records. **7.0** (from **Basle**), Talk: What every Woman should know about the Marriage Laws. **7.30** (from **Basle**), Concert by the Gündeldingen Male Voice Choir, conducted by Ernst Müller. **8.0,** Weather and News. **8.10,** The Violin Sonata—Lecture Recital. **10.0** (from **Basle**), Paganini in Berlin—Radio Scenes (Rombach). **9.20** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.—1.45 to 2.10 p.m.,** Broadcast for Schools, relayed from **Malmö, 1,301 kc/s, 230.6 metres. 4.5,** Religious Address, relayed from **Falun, 977 kc/s, 307 metres. 4.30,** Programme for Children. **4.45,** Gramophone Music. **5.45,** Elementary English Lesson, relayed from **Jönköping, 1,490 kc/s, 201.3 metres. 6.15,** Weather and News. **6.30,** Talk. **6.50,** Violin Solos by Charles Barkel: Sonata in G minor (Locatelli); Prelude and Fugue in G minor (Bach); Tambourin (Leclair). **7.15,** A Play (Capek). **8.45,** Weather and News. **9.0,** Orchestral Concert from the Berne Hall: Overture, Hansel and Gretel (Humperdinck); Waltz from Das Fürstenkind (Lehár); Delibes Potpourri (arr. Urbach); Two Guitars (Feraris); Swedish National Melodies; Dance of the Dervishes (Bendix); March, Le Père, la Victoire (Ganne). **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Variety Music on Gramophone Records. **12.45 p.m.,** News. **1.0,** Time and Exchange. **1.5,** Orchestral Concert, conducted by Maurice de Villers. **2.0,** Programme for Children. **3.0,** Interval. **3.45,** French Elocution Lesson. **4.0,** Programme for Children, relayed from **Bordeaux-Lafayette. 6.0,** Talk: Contemporary German Literature. **6.15,** Talk for Women. **6.30,** Léon Moreau Concert, conducted by Maurice de Villers. Soloists: Jeanne Wild (Songs). Jude (Flute) and Jeanne Wolferstaedter (Pianoforte). Introduction and Rêverie japonais; Two Songs: (a) Elle danse, (b) Elle chante; Flute and Orchestra: (a) Suite Pastorale, (b) Dans la forêt enchantée; Pianoforte Solos: (a) Dans la nuit, (b) Valse brillante; Romance; Two Rural Scenes. **7.30,** Time and News. **7.45,** Talk on the Scout Movement. **8.0,** Press Review in German. Lottery Results and Announcements. **8.30,** Concert by the Calvet Quartet: Quartet in G (Haydn); Quartet (Bonnal); Quartet (Debussy). **10.0** (approx.), Press Review.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW.—Relayed by **Freiburg, 527 kc/s, 570 metres.—11.0 a.m. to 2.0 p.m.,** See **Munich. 2.0,** Concert Relay. **3.0,** Die Hölz-Schlacht—Radio Sketch (Franz Moraller). **4.5,** See **Langenberg. 6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** See **Leipzig. 7.40,** See **Breslau. 8.10,** String Quartet in G Minor (Mozart) by the Wendling Quartet. **8.45,** See **Langenberg. 9.40,** See **Berlin (Funkstunde). 10.20,** See **Berlin (Deutschlandsender). 10.40,** See **Hamburg. 11.5,** See **Frankfurt. 11.35,** See **Heilsberg. 12 Midnight,** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Hawaiian Guitar Music. **6.30,** Orchestral Music. **6.45,** Chansonnettes. **7.0,** Accordion Music. **7.15,** News. **7.30,** Ballet The Fire Bird (Stravinsky), played by the Symphony Orchestra. **7.45,** Music from Sound Films. **8.0,** Music by a Viennese Orchestra. Waldteufel Potpourri (Fucik); The Wedding of the Rose (Jessel); Hungarian Potpourri; Waltz, Très jolie (Waldteufel); Melody (Ziehrer); Viennese Waltz (Drdla); Selection from Gipsy Love (Lehár). **8.30,** Opera Music. Arias from (a) Manon (Massenet), (b) The Pearl Fishers (Bizet); Duet from Act IV of Louise (Charpentier); Chorus from Mirella (Gounod). **8.45,** Orchestral Music. **9.0,** Concert Version of Mam'zelle Nitouche—Operetta (Hervé). **9.30,** Military Music. **9.45,** Variety Concert. **10.15,** News. **10.30,** Concert for Listeners in Morocco. Part I: Operetta Music. Arias from Brummel (Halm); Au pays du soleil (Scotto); La vie parisienne (Offenbach), and Un soir de réveillon (Moretti). Part II: Symphony Music. Selection from Der Bettelstudent (Millöcker); Marche historique (Saint-Saëns); Prélude à l'après-midi d'un faune (Debussy). **11.0,** Chansonnettes. **11.15,** Dance Music. **12 Midnight,** News. **12.5 a.m. (Friday),** Accordion Music. **12.15,** Dance Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—4.10 p.m.,** Music on Gramophone Records. **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Dopolavoro Notes and Gramophone Music. **6.0,** Time, Tourist Talk and Gramophone Music. **6.10,** Market Prices. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** News. **7.15,** Sponsored Music. **7.30,** Gramophone Music. **8.0,** La Belle Hélène—Comic Opera (Offenbach), relayed from the Argentina Theatre, Rome. In the intervals, Talk and Notes. After the Programme, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in French. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: Overture, Alessandro Stradella (Flotow); Fantasia for Orchestra, Der Alcazar (Rochlitzer); Delirien-Walzer (Jos. Strauss); March, Jung Oesterreich (Weiss); Potpourri, Ein Souper bei Suppé (Morena); Das Glückerl (Stolz); Polka, Triton from Perle von Iberien (Hellmesberger); Waltz, In deinen Armen (Meyer-Heemund); The Dwarf's Festival (Noack); Mutterl (Eysler); Waltz Potpourri (Robrecht). In the interval at **10.55,** Weather. **12 Noon,** Time, Weather, News, Programme Notes, and Announcements. **12.10 p.m.,** Gramophone Concert: Moritz Rosenthal (Pianoforte): Hungarian Rhapsody No. 2 (Liszt); W. H. Squire ('Cello): Le Cygne (Saint-Saëns); Jehudi Menuhin (Violin): Adagio from the Violin Concerto in G (Mozart); Pablo Casals ('Cello): Moment musical (Schubert); Wilhelm Backhaus (Pianoforte): Waltz from Naila (Delibes); Erica Morini (Violin); Valse Caprice (Wieniawsky); Alfred Cortot (Pianoforte); Hungarian Rhapsody No. 11 (Liszt); Fritz Kreisler (Violin): Allegretto (Boccherini-Kreisler); Alexander Brailowsky (Pianoforte): Pastorale and Caprice (Scarlatti). **1.0,** Interval. **2.0,** Time, Weather, Exchange, and Market Prices. **2.20,** Talk: The Danger of Unsterilised Food. **2.35,** Talk for Young People. **2.55,** Gramophone Concert: The Brandenburg Concerto No. 4, in C (Bach); Introduction to The Golden Cockerel (Rimsky-Korsakov); Prelude to Fervaal (d'Indy); Marche des petits soldat de plomb (Pierné). **3.40,** Talk for Women. **4.5,** Talk. **4.30,** Soprano Song Recital, by Rose Merker: Heil'ge Quelle, from Figaro (Mozart); Aria from Tosca (Puccini); Elisabeth's Aria, from Tannhäuser (Wagner); Songs (Schubert): (a) An die Musik, (b) Am Meer, (c) Allmacht; Songs (Brahms): (a) O Wüsst' ich doch den Weg zurück, (b) Mainacht, (c) Vergebliches Ständchen, (d) Meine Liebe ist grün; Songs (Rinkens): (a) Lebensweg, (b) Die Wiese schäumt von Blüten. **5.5,** Talk: The Prospects of International Trade. **5.55,** Theatre Talk. **6.0,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: March, Jetzt wird's g'mütlich (Kronegger); Overture, Blumenfest (Fetras); Zwanzinette (Lehár); Potpourri, Anno dazumal (Morena); Serenade, San Remo (Hummer); Waltz, Dorfkinder (Kálmán); Wiener Wald (Chmel); Potpourri, Wiener Spezialitäten (Hruby). In the interval at **6.35,** Time, Weather, and Programme Announcements. **7.0,** Kabale und Liebe—Tragedy (Schiller). **9.0,** News. **9.15,** Dances and Marches from Opera—Concert by the Wiener Symphoniker, conducted by Theodor Christoph: Coronation March from The Prophet (Meyerbeer); Waltz from Faust (Gounod); Furiant from The Bartered Bride (Smetana); Polovtsian Dances from Prince Igor (Borodin); March from The Loves of the Three Oranges (Prokofiev); Polonaise from Boris Godunov (Mussorgsky); Two Dances from Aïda (Verdi); Entry March from Tannhäuser (Wagner); Waltz from Der Rosenkavalier (R. Strauss); Dance of the Apprentices and Entrance of the Mastersingers, from The Mastersingers (Wagner). After the Concert, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5,** Music by Village Bands (on Gramophone Records). **11.30,** Radio Journal. **11.35,** Concert by the Warsaw Philharmonic Orchestra, conducted by Oziminski. Soloist: Maj (Baritone). Introductory Talk. **1.0 p.m.,** Weather. **1.3,** Interval. **2.30,** Economic Notes. **2.40,** Light Music. **3.40,** Talk: The Woman and Social Work. **3.55,** Song Recital by Goebel-Tarnawa (Bass). **4.20,** Beethoven and Wolf Song Recital by Eugenie Hoffman. **4.50,** Agricultural Notes. **5.0,** Talk on Economics. **5.20,** Dramatic Programme. **6.5,** Miscellaneous Items. **6.25,** Topical Talk. **6.40,** Programme Announcements. **7.0,** Concert by the Station Orchestra, conducted by Nawrot. Soloist: Elna Gietedt (Songs). In the interval at **8.0,** Wireless Notes. **9.0,** Sports Notes. **9.10,** Dance Music from the Femina Cabaret. In the interval at **10.0,** Aviation Weather Report and Police Notes.

WILNO

530 kc/s, 566 metres; 16 kW.—**6.5 p.m.,** The Letter Box. **6.25,** See **Warsaw. 6.40,** Programme Announcements. **6.45,** Programme from **Warsaw. 7.0,** Concert of Request Gramophone Music. **8.0** till Close Down, Programme from **Warsaw.**

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—**6.30 p.m.,** Announcements and News. **7.0,** Tchaikovsky Concert, relayed from **Belgrade, 698 kc/s, 429.7 metres. 9.0,** News, Weather and Programme Announcements. **9.15,** Dance Music. **10.0** (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender**

FRIDAY
NOVEMBER THE TENTH

ALGIERS

15.5 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes, Agricultural Report and Weather. **7.20,** Operetta Music: Airs from The Black Tulip (Richepin), La fauvette du temple (Messager), Azor (Gabaroche), Paganini (Lehár), L'amour masqué (Messager), Un soir de reveillon (Moretti), and La Périchole (Offenbach). **7.55,** News. **8.0,** Time and Lottery Results. **8.10,** Symphony Concert by the Station Orchestra, conducted by Henry Defosse: Symphony No. 1 (Brahms); English Suite of the Seventeenth Century (Rabaud); Violin Solo: Poème (Chausson); Rondo capricieoso (Saint-Saëns); Marche ecossaise (Debussy). In the interval at **8.45,** News and Gramophone Records. **9.30,** News. **9.35,** Accordion Music. **9.50,** Flute Solo. **9.55, News.**

ATHLONE

525 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gardening Talk. **7.15,** Literary and Dramatic Talk. **7.30,** Time Signal. **7.31,** Violin Duets by Mabel and Una Kenny. **7.50,** Pianoforte Recital by Rita McNamee. **8.0,** Concert, relayed from St. John's Pavilion, Limerick. **9.0,** Uilleann Pipe Solos by Leo Rowsome. **9.15,** Contralto Solos by Elizabeth Downey. **9.30 to 10.30,** Programme by the I.B.C. Ireland), Ltd. **9.30,** Concert, Balalaika Orchestra: Waltz Impromptu (Andraiev); In the Pine Forest (Fomeon); Le Rêve (Andraiev); The Red Sarafan (arr. Leontiev); Russian Folk Song, Non Gony; Spanish Dance (Andraiev); Russian Folk Song, Lovely Night (arr. Leontiev); Song of the Volga Boatmen. **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.; Dance Music: Jamaica-Jamaica-Do-Do-Do; Never too old; Waltzing alone with you; The River's takin' care of me; Smoke Rings; Lullaby of the Leaves; Lazybones; It's within your Power. **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** Irish Music. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Overture, Die schöne Galathée (Suppé); Gavotte and Minuet from Manon (Massenet); A Poet's Life (Elgar); Selection from Cavalleria rusticana (Mascagni); Chant russe (Lalo); Bagatelle (Alday); Gipsy Dance (Michiels). **7.0,** Request Gramophone Records. In the interval, Exchange. **8.0,** Gramophone Music and News. **8.30,** Catalan Educational Programme: History and Geography Lesson. After the Programme, Messages to Seamen. **9.0,** Chimes from the Cathedral, Weather. **9.5,** Exchange and Market Prices. **9.5,** Concert by the Radio Orchestra. **10.0,** Song Recital by Juan Barrabés (Tenor). **10.15,** Quintet Concert, relayed from the Café Viena. In the interval at **11.0,** News. **12.0 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Gramophone Music. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

398 kc/s, 429.7 metres; 2.8 kW.—**6.0 p.m.,** Concert by the Radio Orchestra. **7.0,** Pantsche Wladigerov Pianoforte Recital by the Composer. **7.40,** Programme relayed from **Zagreb, 977 kc/s (307 metres). 9.0,** Time and News, followed by Dance Music from the Zanatsky Dom Restaurant. **10.0,** Dance Music on Gramophone Records.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**11.5,** Concert of Overtures on Gramophone Records: Der Schauspieldirektor (Mozart); Der Freischütz (Weber); Egmont (Beethoven); Lohengrin (Wagner); Iphigenia in Aulis (Gluck); Der Rosenkavalier (R. Strauss). After the Concert, Weather for Farmers. **11.55,** Time Signal. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Gramophone Concert: Eine kleine Nachtmusik (Mozart); Second and Third Movements from the Symphony No. 3 in D (Schubert); Adagio from the Violin Concerto in D (Brahms); Salome's Dance (Richard Strauss). **1.30,** The Day's Watchword. **1.35,** Gramophone Concert (contd.): Selection from Intermezzo (Richard Strauss); Valse impromptu (Liszt); Polonaise No. 2 (Liszt). **2.0,** Talk for Girls. **2.30,** Weather and Exchange. **2.45,** A German Fairy Tale. **3.0,** See **Leipzig. 4.0,** Radio Reports from a Canary Show (on Gramophone Records). **4.20,** Contemporary Violin and Pianoforte Music by Hilde Elgers (Violin), Paul Eggert and Kurt Schubert (Pianoforte): Violin and Pianoforte Duets: (a) Wiegenlied (Juon), (b) Walzer Arva (Juon), (c) Pastorello, (d) Nächtliche Schildwache, and (e) Gigue (Schrattenholz); Pianoforte Solo: Prelude and Fugue from Dem Gedächtnis der Toten (Baussnern). **5.0,** The Day's Watchword. **5.5,** Hugo Wolf Song Recital by Ruth Scholz. **5.25,** Dialogue between Dr. Harald Braun and Dr. Adolf Ehrt: The Persecution of Christians in the Twentieth Century. **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations: The Surprise Symphony (Haydn) by The Philharmonic Orchestra, conducted by Edwin Lindner. **6.30,** Address by Adolf Hitler, followed by Octet (Schubert) by Georg Fahl and his Chamber Orchestra. **9.0,** News and Sports Notes. **9.45,** Weather. **10.0,** Concert from **Breslau. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—12 Noon,** Gramophone Concert; Part I, Schumann Music. In the interval at **12.40 p.m.** (approx.), News. **1.55,** Exchange Quotations and Agricultural Prices. **2.15,** The Day's Watchword. **2.20,** Talk for Parents. **2.35,** A Radio Sequence. **2.55,** Review of New Books. **3.5,** A Discussion on the Reorganisation of the German Automobile Club. **3.20,** Talk: Forgotten Books. **3.30,** Concert by Lothar Karau's Quintet. In the interval at **4.10** (approx.), All kinds of Animals—A Radio Sequence (Hans Eich). **5.5,** The Day's Watchword. **5.10,** Radio Report. **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 6.30,** Concert by the Station Orchestra, conducted by Karl Rockstroh. **9.0,** News and Sports Notes. **9.15** (approx.), Concert by the Lothar Karau Quintet, with Gramophone Records. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News. **7.40,** Gramophone Music. **7.55,** Lottery Results. **8.0,** Spanish Lesson. **8.15,** News. **8.30,** Programme relayed from **Lille, 1,130 kc/s, 265.4 metres.**

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**6.10 p.m.,** Talk. **6.25,** See **Prague. 7.0,** See **Moravská-Ostrava. 7.30** till Close Down, See **Prague. 9.30** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—12.20 p.m.,** Weather. **12.25,** Gramophone Concert: Overture, Donna Diana (Reznicek); Extract from Arabella (R. Strauss); Variations on the Quintet, Die Forelle (Schubert); Serenade (Wolf). **12.45,** Time and News. **1.10,** Tenor Song Recital by Walter Linke: Der Wanderer (Schubert); Schäfers Klagelied (Schubert); Im Feld des Morgens früh (Burkhardt); Folk Song (Pfitzner); Alle Tage ist kein Sonntag (Clewing); Veilchen (Pretzsch). **1.35,** The Day's Watchword. **1.40,** Agricultural Prices. **2.0,** Orchestral Concert, conducted by Ernst Topitz: Comedy Overture, Hokuspokus (Leuschner); Im Märchenwald (Ganglberger); Potpourri, Strauss-Millöcker-Suppé (Ziehrer); Frühlingsmarsch (Mausz); Waltz, Krolls Ballklänge (Lumbye); Schlosswache der Ameisne (Rathke); Selection from Der Obersteiger (Zeller); Overture, Frau Meisterin (Suppé). **3.15,** A Discussion: Books for Young People. **3.45,** Talk: American Mine Fields. **4.0,** Readings (Hermann Stehr and Joseph Wittig). **4.30,** Programme to be announced. **4.50,** Concert by the Station Orchestra, conducted by Ernst Topitz: March (Piercy); Waltz, O Frühling, wie bist du so schön (Lincke); Potpourri, Wiener Weisen auf Reisen (Reckteuwald); Wie schön ist mein München (Ludwig); Es liegt eine Krone im grünen Rhein (Pachernegg); Potpourri, Ein Walzer-Kommers (Hildebrandt); Kopf hoch (Manfred). **5.40,** The Day's Watchword. **5.50,** Meat Market Prices. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** Programme to be announced. **9.0,** Time and News. **9.40,** Harmonium Recital by Hans Wesemann: Adagio from the Suite in D (Bach-Karg-Ehlert); Allemande (Handel-Wesemann); Sarabande (Handel-Wesemann); Suite No. 2 in D, Op. 37 (C. Schumann). **10.30** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: Sports Notes, Talk on Economics, and Talk on Earthquakes. **6.0,** See **Prague. 7.0,** Quintet, Op. 23 (Konak) by the Moravian Wind Quintet. **7.30,** See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R.; 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Birds and Flowers Concert by the Small Station Orchestra, conducted by Leemans. **1.0 p.m.,** Le Journal Parlé. **1.10,** Souvenirs—Gramophone Concert. **5.0,** The Great War—Concert by the Radio Orchestra, conducted by Charles Walpot. Soloists: Delstanches (Baritone) and Schroef (Tenor). Commentator: Major Danneels. **6.0,** Talk: Foresting in the Colonies. **6.15,** Extracts from Sigurd Jorsalfar (Grieg) on Gramophone Records. **6.30,** Concert of Cigány Music by the Small Station Orchestra, conducted by Leemans: Slav Dances Nos. 1 3, 6, and 8 (Dvorák); Czardas No. 1 (Michiels); Selection from Gipsy Love (Lehár); Tango, Jealousy (Gade); Paraphrase on Hungarian Themes (Padoneck); Hungarian Dances (Brahms). **7.15,** Talk: Physical Training. **7.30,** Legal Review and Literary Review. **8.0,** Concert by the Radio Orchestra, conducted by Charles Walpot, and the Vocal Quintet of the Royal Military Museum. Belgian and French Songs and Music, arranged by Engène Colin. In the interval at **8.45,** Talk: Are Pensions for the War-disabled a Civil Right guaranteed by the Constitution? After the Concert, News for Soldiers and Ex-Servicemen. **10.0,** Le Journal Parlé. **10.10,** La Brabançonne.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—**12 Noon,** Act II of Madame Butterfly—Opera (Puccini) on Gramophone Records. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: March, the Globe-trotter (Leopold); Viennese Waltz (Delmas); Mendelssohn Potpourri (Foulds); Meditation from Thaïs (Massenet); Saltarello, La Tilda (Cilea); Potpourri, Achtung! Achtung! (Dostal); Berceuse blanche (Guillemyn); Selection from White Horse Inn (Benatzky). **5.0,** Dance Music from the St. Sauveur Palais de Danse. **6.15,** Talk: The Origin of Contagious Diseases. **6.50,** Pianoforte Recital by Van Durme. **7.0,** Gramophone Concert: Petite rapsodie improvisée (Tournemire); Quartet in B flat (Mozart); Andantino (Tournemire). **7.30,** Wireless Notes. **8.0,** Gala Concert by the Augmented Symphony Orchestra, conducted by Desiré Defauw; Soloist: Marcel Gazelle (Pianoforte); Symphony (Schumann); Pianoforte Concerto (Herberigs). **9.0,** Kormis—Radio Play (Thiry). **9.30,** Concert (contd.): Rugby (Honegger); Shepherd's Hey (Grainger); Airs angevins (Leheu). **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert by the Station Orchestra: Overture, Rosamund (Schubert); Cockney Suite (Ketelbey); Selection from Madame Butterfly (Puccini); Waltz, Estudiantina (Waldteufel); Selection from Gasparone (Millöcker); Capriccio, Diavoletta (Lindemann); Humoresque, Frog's Wedding (Beil); Andalusian Serenade (Armandola); Gallop, Purzelbaum (Lincke). In an interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Missa Solemnis (Beethoven), by the Philharmonic Orchestra, conducted by Georgesco, relayed from the Athaeneum. **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **6.30 p.m.** till Close Down. **4.15 p.m.,** Concert by the Symphony Orchestra of Unemployed Musicians, conducted by Bela Melles. **5.15,** Shorthand Lesson. **5.45,** Talk, with Gramophone Illustrations: A Trip to the Balkans. **6.30,** Faust—Opera in Five Acts (Gounod), relayed from the Royal Hungarian Opera House. News in the intervals. After the Opera, Cigány Music.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY, 31.51 metres.—11.0 a.m.,** Time and Chimes from the Town Hall. **11.5,** String Ensemble Concert relayed from the Hotel d'Angleterre. **1.0,** Interval. **1.30,** Readings from the Works of Jarl Hemmer. **2.0,** Concert by the Radio Orchestra, conducted by Fritz Mahler: Extracts from Divertimento No. 17 in D (Mozart); German Dance (Schubert-Weber); Annen-Polka (Joh. Strauss, Sen.); Overture, Der Waldmeister (Joh. Strauss); Violin Solos by Marie Schioler-Kiorboe: (a) Arietta (Martini), (b) Minuet (P. E. Bach), (c) Melody (Gluck), (d) German Dance (von Dittersdorf), (e) La Précieuse (Couperin); Festival March from Idomeneo (Mozart); Minuet from the Serenade in D (Brahms); Overture, A Midsummer Night's Dream (Mendelssohn); Extract from Der Rosenkavalier (R. Strauss); Waltz, Dorfschwalben aus Osterreich (Joh. Strauss); Overture, Boccaccio (Suppé). **4.0,** Programme for Children—Reading and Musical Programme. **4.30,** Exchange and Fish Market Prices. **4.45,** Literary Talk: Kaalund's Poetry. **5.15,** Elementary German Lesson. **5.45,** Weather. **5.54,** Announcements **6.0,** News. **6.15,** Time Signal. **6.20,** Talk. **6.50,** Programme by Per Knutzon. **7.0,** Time Signal from the Town Hall. **7.1,** Luther Memorial Concert by the Radio Orchestra and the Palestrina Choir for the Four Hundred and Fiftieth Anniversary of his Birth. **8.0,** Gramophone Concert of Songs from Sound Films. **8.15,** Vor Tids Helt—Radio Play in Three Acts (Ludvig Brandstrup and Holger Bech). **9.5,** News. **9.20,** Saxophone and Pianoforte Recital by Paul Kisbye and Viktor Fischer: Pianoforte: Rhapsody, Contrasts (Sims); Saxophone Concerto No. 2 in E flat (Cragun). **9.50,** Dance Music by the Aage Juhl-Thomsen Band, relayed from the National Scala. In the interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour; Part I: Signature Tune; Hawaiian Music; My South Sea Home; Reef of Stars; Hawaiian Sweetheart of Mine; Maui Girl; What Aloha means; The Blue Bird; Somewhere in Hawaii; My Waikiki Mermaid; Part II, Dance Music: Oh! Johanna; My Kingdom for a Smile from you; My own; Tango, Solitario; The Last Roundup; I bring a Song; Isn't this a Night for Love; I've got to pass your House; Signature Tune. **12 Noon,** Programme in French. **4.30 to 6.0 p.m.,** Programme in English by the I.B.C. **4.30 p.m.,** I.B.C. Nursery Corner. **5.0,** Concert for Southampton and Winchester Listeners; Orchestral Concert: Signature Tune. The Night by the Sea; A Radio Roundabout (Noack); Romance (Löhr); El Relicario (Padilla); Xylophonia (Green); Life in the Vienna Prater (Translateur); Snappy Sticks (Robbins); Danse bagatelle (Bourdon); The Toymaker's Dream (Golden). **5.30,** Gramophone Concert for Bournemouth and Weymouth Listeners: Reflections in the Water (Loeb); Reminiscences of Gilbert and Sullivan; I had to go and find another Job; Putting it on; A Farewell; Wid de Moon, Moon, Moon; Goodnight, but not goodbye; Valeta Medley; Signature Tune. **6.0,** Programme in French. **10.0** till Close Down, Programme in English by the I.B.C. **10.0** (approx.), Dance Music: Signature Tune, Bells of Normandy; Don't blame me; I've got to pass your House; My Moonlight Madonna; Nunca; Old Man Harlem; Happy as the Day is long; I bring a Song; Isn't this a Night for Love?; Sentimental Gentleman from Georgia; Lazybones; Wedding of the Dragonflies; Won't you stay to Tea? There's a tiny little Hair upon your Shoulder; Little Miss Muffet; Mi Amor esta en el valle; Oh, Johanna; Hold your Man; Signature Tune. **11.0,** Broadcast of Music Hall and Musical Comedy Memories; Selection of Old Music Hall Memories; Tea for Two from No. No. Nanette (Youmans); Morning, Noon and Night; Daisy Bell; Selection from The Merry Widow (Lehár); I got Rhythm; Two little Girls in Blue (Graham); Waltz, Mary Rose (Parr-Davies); Selection from The Belle of New York (Kerker). **11.30,** Club Concert for Greenock and Craigendoran Listeners; Part I: Orchestral Music: Signature Tune, The Chum Song; March, The Gridiron Club (Sousa); The Busy Bee (Bendix); Her first Dance (Heykens); The Old Folks at Home (Foster); My Lady Dainty (Hesse); Selection from The Quaker Girl (Monckton); Pianoforte Solo, That futuristic Rag (Bloom); Pride of the Wolferines (Sousa). **12.5 a.m.,** The I.B.C. Late News Bulletin. **12.10 a.m.** (approx.), Club Concert, Part II: Moon over Dixie; Hot Toddy; A big Bouquet for you; Conchita; Rocky Road; Signature Tune. **12.30,** Dance Music: Louisville Lady; The Wedding of Mickey Mouse; Selection from Dinner at Eight; Solitario; Out in the Open; The Dicty Glide; Dance pretty Lady; I'll show you off. **1.0,** Dance Music: Signature Tune, Bells of Normandy; There's a Cabin in the Pines; Ding, Dong, Ding; Let's make up; Aloha Oe!; The Last Roundup; Goodnight, little Girl of my Dreams; Adios Goodbye; Tick Tock; It's the Talk of the Town; My own; Isn't it Heavenly?; Mary Rose; With you here and me here; Trouble in Paradise; Sing another Line; I live for Love; Signature Tune. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—11.0 a.m.,** Concert by the Station Orchestra, conducted by Dr. Reinhold Merten. Soloist: Mizzi Schneider-Kögler (Songs). Overture,

Eine Nacht in Venedig (Joh. Strauss); Waltz, Am grünen Rhein (Beringer); March, Grüss Gott. Wien (Komzak); Viennese Songs; Waltz (André); Erinnerung an Luzern (v. Blon); March, Zürich (Heusser); Waltz, Mein schönster Tag in Berlin (Gungl); Viennese Songs; Waltz, Mein Herz hängt an Wieu (Ziehrer); Parade March from Eine Nacht in Venedig (Joh. Strauss). **12.15 p.m.**, Time and News. **12.25**, Local News and Weather. **12.35 to 1.30**, See **Stuttgart.** **1.40**, Programme for Housewives. **2.30**, Weather Report. **2.40**, Time and Market Prices. **3.0**, Concert by the Station Orchestra, conducted by Dr. Reinhold Merten. Soloist: Henny Schmitt (Contralto), Friedrich Kempf (Tenor), Johann Friedrich Hoff (Violin) and Hans Rosbaud (Pianoforte); Symphony No. 97 in C (Haydn); Sonata, Op. 32, No. 1, for Violiu and Pianoforte (Hoff); Songs (Hoff); Overture, Ihre Excellenz (Heuberger); Mntzi-Marsch (Hellmesberger); Operetta Songs; Waltz, Tanz-Kandidaten (E. Strauss); Operetta Songs; Victoria-Polka (Jos. Strauss); Incognito-Walzer (Ivanovici); Operetta Songs; Teufelsmarsch (Suppé). **5.0**, See **Langenberg.** **5.50**, News, Market Prices, Programme Announcements and Time. **6.0**, Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **7.0**, Topical Programme. **7.10**, See **Langenberg.** **9.0**, Time and News. **9.20**, See **Stuttgart.** **9.30**, Local News and Weather. **9.45**, Light Music. **10.0**, Concert by the Station Orchestra, conducted by Haus Rosbaud. Soloist: Herbert Hesse (Baritone). Overture. Alcina (Handel); Arias from Julius Cæsar (Handel); Ballet Music from Alcina (Handel); Overture, Cosi fan tutte (Mozart); Aria from Cosi fan tutte (Mozart); Aria from Figaro (Mozart); Extract from Idomeneo (Mozart); Ha! welch ein Augenblick, from Fidelio (Beethoven); Overture, Fidelio (Beethoven). **11.0**, Talk: The Painter, Hans v. Marees. **11.45** (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—**4.0 p.m.**, Variety Programme. **5.0**, Topical Programme. **5.40**, Frankfurt Exchange and Hamburg Market Prices. **5.50**, Weather. **6.0**, Transmission for all German stations, relayed from **Berlin (Deutschlandsender).** **7.0**, Programme from **Berlin (Deutschlandsender).** **9.0**, Time and News. **9.20**, Concert.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig; 671 kc/s, 447.1 metres.**—**12.5 p.m.**, Gramophone Concert: Ballet Suite (Gluck); 'Am Meer (Schubert); Eine kleine Nachtmusik (Mozart); Scherzo in E minor (Mendelssohn); Air (Pergolesi); Romances Nos. 1 and 2 (Schumann); Wanderers Nachtlied (Schubert); Ständchen (Schubert); Immer leiser wird mein Schlummer (Brahms); Hungarian Dance No. 5 (Brahms); Rondo from the Spring Sonata in F (Beethoven). In the intervals at **12.20** and **1.0**, News. **1.30**, Programme arranged by the Post Office with Gramophone Records. **2.0**, Agricultural Prices and Exchange. **2.10**, Talk. **2.15**, Readings for Children. **2.40**, Talk for Women. **3.0**, See **Leipzig.** **4.30**, Talk: Game Reserves in East Prussia. **5.0**, Radio Sequence. **5.20**, Agricultural Prices. **5.25**, Concert by a Trombone Quartet: Fahr wohl, du goldene Sonne (Beethoven); Silberblauer Mondenschein (Schubert); Bald prangt, den Morgen zu verkünden (Mozart); Wiegenlied (Brahms); Tfinklied (Schubert); Das Kirchlein (Becker); Die Träne (Witt); Aufruf zur Jagd (Pohlenz). **5.50**, Talk. **5.55**, Weather. **6.0**, Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **6.30**, Programme to be anuounced. **9.0**, News and Sports Report. **9.20**, Modern German Dance Music.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.** and 20 kW. from **5.40 p.m.**—**11.40 a.m. to 3.40 p.m.**, Programme of the General Broadcasting Society (A.V.R.O.). **11.40**, Time Signal and Gramophone Music. **12.10 p.m.**, Concert of Light Music by Kovacs Lajos and his Orchestra. **2.10**, Recitations. **2.40**, Gramophone Music. **3.40 to 7.40**, Programme of the Workers' Radio Society (V.A.R.A.). **3.40**, Concert by the Small Station Orchestra, conducted by de Groot: Selection from Im Reiche des Indra (Lincke); Ums blaue Band (Krome); Serenade (Widor); Nocturne in E Flat (Chopin); Yellow Roses (Suppé); Ridonatemi la calma (Tosti); Serenata napolitana (Rivelli); Magyar Dalok (Lehar). **4.30**, Programme for Children. **5.10**, Concert of Light Music. **6.20**, Talk on Fascism. **6.40**, Concert by the Walford Hyden Magyar Orchestra, relayed from **London**; Soloist, Olive Groves (Songs). **7.40** to **10.40**, Programme of the Liberal Protestant Radio Society (V.P.R.O.). **7.40**, Talk. **8.10**, Pianoforte Recital. **8.40**, Talk. **9.10**, Pianoforte Recital (contd.). **9.40**, Religious Notes and News. **9.55**, Talk **10.25**, Gramophone Music. **10.40** till Close Down, Programme of the V.A.R.A. Concert: Black Eyes (arr. Campolmi); Dort, wo die Wälder grün (Brodsky); Negro Cradle Song (Clutsam); Zigeuner, du hast mein Herz gestohlen (Grothe); Melody (Rhode); Gramophone Music: A une femme charmante (Codini); Melody (Lebert); Griserie (Crémieux); Du schwarzer Zigeuner (Vacek); Zaragossa (Gredos); Penso a te (Tosti); Melody (Knorr-Renes).

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW until **3.40 p.m.** Transmitted from **Kootwijk,** on 50 kW from **3.40 p.m.**—Programme of the Christian Radio Society (N.C.R.V.). Martin Luther Festival Programme. **10.10 a.m.**, Divine Service. **10.40**, Religious Reading. **11.10**, Bach Music on Gramophone Records. **11.40**, Police Messages. **11.55**, Gramophone Music. **12.10 p.m.**, Organ Recital by Bonset. Prelude to Ein feste Burg ist unser Gott (Hanv); Psalm (Marcello); Aus der Tiefe rufe ich (Bach); Vater unser im Himmelreich (Bach); Allegro aud Finale from the Sonata No. 3 (de Lange); A Hymn of the Reformation; Fantasia on Ein feste Burg ist unser Gott (arr. Bonset); Festival Hymns (Piutti); Variations and Fugue on a Theme of Purcell (Bonset); Three Hymns of the Reformation. Prelude to Wer nur den guten Gott lässt walten (Dienel); Song of Thanksgiving (Diggle); Festival Music on Ein feste Burg ist unser Gott (Wiedenhagen). **1.40**, Talk on Lutheranism. **2.40**, Gramophone Music. **3.10 to 3.40**, Interval. **3.40**, Bible Reading and Sacred Songs to the Organ. **4.40**, Concert by the Van der Horst Ensemble. Entry of the Guests into the Wartburg from Tannhäuser (Wagner); Hymn of the Reformation; Selection from The Huguenots (Meyerheer); Dutch Songs; Gramophone Music; Overture, Joseph (Méhul); Tre Giorni (Pergolesi); Adagio (Mann); Arioso (Handel); Meditation (Bach-Gounod); Song without Words (Mendelssohn); Adagio (Beethoven). **6.10**, Programme for Children. **6.40**, Police Messages. **6.55**, Religious News. **7.10**, Literary Talk. **7.40**, Divine Service, relayed from the Lutheran Church, Amsterdam. After the Service, Gramophone Music and News. **9.55**, Organ Recital by Blaauw. **10.40**, Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.**, Amusement Guide, Financial Notes, Racing Results and News. **8.10**, Esperanto Lesson. **8.30**, Radio Concert. **9.0**, News and Weather. **9.15**, Recital of Classical Music.

KALUNDBORG.—See **Copenhagen.**

KATOWICE

734 kc/s, 408 metres; 16 kW.—**6.20 p.m.**, See **Warsaw.** **9.25**, Gramophone Music. **10.0**, The Letter Box in French.

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by **Helsinki, 815 kc/s, 368.1 metres.**—**4.0 p.m.** (from **Helsinki**), Concert by the Station Orchestra, conducted by Erkki Linko. **4.30**, Talk. **5.15** (from **Helsinki**), Song Recital by Auli Mikkola. **5.40**, Talk. **6.5** (from **Helsinki**), Kajanus Commemoration Concert, relayed from the University. The Municipal Orchestra, conducted by Selim Palmgren. Leevi Madetoja and Toivo Haapanen: Symphonietta; Funeral March, Kullervo; Finnish Rhapsody No. 1; Variations on a Theme of Kajanus. **7.45**, News in Finnish. **8.0**, News in Swedish.

LANGENBERG

635 kc s, 473 metres; 60 kW.—**12.25 p.m.**, News and Weather. **12.35**, See **Stuttgart.** In the interval at **1.0**, Talk: The Watchword. **1.30**, Talk: Cottage Industries in the Rhineland. **1.45**, Concert by the Fröhliche Fünf, with Instrumental Music. **2.30**, Market Prices. **2.50**, Political Announcements. **3.0**, See **Frankfurt.** In the interval at **3.40**, Talk: The Watchword. **4.40**, Radio Report of the St. Martin's Day Procession, relayed from **Crefeld.** **5.0**, An Interlude. **5.20**, A Worker's Home-coming — Radio Report. **5.50**, Announcements. **6.0**, Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **7.0**, See **Frankfurt.** **7.10**, Concert by the Station Orchestra, conducted by Buschkötter. **9.0**, See **Frankfurt.** **9.20**, See **Stuttgart.** **9.30**, News and Sports Report. **9.45**, See **Frankfurt.**

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**12.15 p.m.**, News and Programme Announcements. **12.30**, Gramophone Music. **1.15**, News. **1.30**, Art Review. **1.40**, Programme for Children. **2.10**, A Radio Sequence. **2.30**, The Watchword. **2.35**, Market Prices. **3.0**, Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber: Overture, Rosamunde (Schubert); Entr'acte and Ballet Music from Donna Diana (von Reznicek); Ständchen and Polonaise from the Serenade in D (Draeseke); Spanish Caprice (Rimsky-Korsakov). **4.0**, See **Berlin (Deutschlandsender).** **5.0**, Songs on Gramophone Records. **5.40**, The Watchword. **5.45**, Market Prices. **5.50**, To-day's News. **6.0**, Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **8.30**, Concert by the Station Orchestra, conducted by Theodor Blumer. Soloists: Erna Hähnel-Zuleger (Soprano) and Emil Luh (Violin). In the interval at **9.0**, News and Sports Notes. **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.**, Gramophone Concert. **5.30**, Talk. **6.0**, Talk for Sokols. **6.30**, Hints for the Week-End. **7.0**, Programme from **Zagreb, 977 kc/s, 307 metres.** **9.0**, Weather and News. **9.15** (approx.), Dance Music.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW. Dutch Evening.—**7.0 p.m.**, Gramophone Music: Ballet Music from Le Cid (Massenet); Symphonic Poem, L'Apprenti sorcier (Dukas). **7.35**, Symphony No. 1 in C, Op. 21 (Beethoven), on Gramophone Records. **8.15**, Selection from The Merry Wives of Windsor (Nicolai), on Gramophone Records. **8.25**, Recital of German Songs by Otto Niedner (Tenor). **8.50**, News in French. **9.0**, Pianoforte Recital by Arend Koole: Toccata (Sweelinck); Variation on a Theme from Willem van Nassau (Mozart); Preludes (Sigtenhorst-Meyer); Avondachemer (Diepenbrock); Ballad (Julius Röntgen); Five Pieces for Pianoforte (Dresden); Sonatina (Pyper). **9.40**, La Folia (Corelli), on Gramophone Records. **9.50**, News in German. **10.0**, Potpourris on Gramophone Records. **10.25**, Dance Music on Gramophone Records.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.**, Announcements. **6.20**, See **Warsaw.** **6.40**, Programme Announcements. **6.45** till Close Down: See **Warsaw.** **10.30** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—**7.40 p.m.**, Radio Gazette for Lyons and the South East. **8.30**, Gramophone Music. **8.40**, Relay from the Salle Molière. After the Relay, News Bulletin.

MADRID

ARANJUEZ, 10,000 kc/s, 30 metres; 20 kW. **10.30 p.m.**, Concert of Popular Music. In the interval at **10.45**, Radio Chronicle. **11.45**, Light Music. **12 Midnight** till Close Down. Programme in English by the I.B.C. Light Music. Song of the Islands (King); I am so anxious, dear (Gilbert); Once I fell in love (Canaro); The Rosary (Nevin); A Penny for your Thoughts (Cuevas); Hot Feet (McHugh); Amalio; Soft Lights and Sweet Music (Berlin). **12.30 a.m. (Saturday),** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.**, Chimes, Exchange, Announcements and Programme for Women with Gramophone Records. After the Programme, Dance Music. **8.15**, Topical Review. **8.30 to 9.30**, Interval. **9.30**, Chimes, Time and Topical Review. **9.45** (approx.), Manon—Opera (Massenet), on Gramophone Records. **11.45**, Topical Review, and Programme Announcements for Listeners Abroad. **12 Midnight,** Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**3.0 p.m.**, Concert by the Station Orchestra, conducted by Plichta: The Dancing Doll (Poldini); Waltz (Provaznik); Ballet Music from Ritter Pasman (Johann Strauss); Waltz (Tichy); Florentine March (Fucik). **3.55**, See **Prague.** **5.5**, Tourist Report. **5.15**, See **Prague.** **7.0**, Concert by the Station Orchestra, conducted by Musil. **7.30** till Close Down, See **Prague.** **9.30** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.**—**10.45 a.m.**, Weather. **1.45 p.m.**, Weather. **2.0**, Concert. **3.0**, Readings. **4.30**, Programme for Young People. **5.30**, Tchaikovsky Concert: Quarte in D; Songs; Quartet No. 3 in E minor **8.0**, News. **8.30**, Programme Announcements **8.55**, Chimes. **9.5**, Press Review. **10.0** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by **Augsberg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres**—**3.25 p.m.**, Orchestral Concert: Prelude to Oberon (Weber); Selection from La Traviata (Verdi); Allegretto quasi Andantino (Schubert); Kaiserwalzer (Strauss); Potpourri Wiener Spaziergänge (Komzak); Triumph Marsch (Fucik). **4.40**, Reading. **5.0**, The Watchword. **5.5** (from **Nürnberg**), A Musical Journey—Fritz Behrend in a Pianoforte Recital of his own Works. **5.25**, Talk. **5.45**, Time, Weather and Agricultural Report. **6.0**, Transmission for all German Stations, relayed from **Berlin (Deutschlanssender).** **7.5**, Radio Sequence. **7.45**, Concert by the Station Orchestra, conducted by Hans Winter. Soloist: Enrico Mainardi ('Cello): Overture, The Ruins of Athens (Beethoven); 'Cello Concerto (Boccherini); Symphony, The Schoolmaster (Haydn). In the interval Talk: St. Martin. **9.0**, Time and News.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Nottodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres;** and **Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy LCL** (See Short-Wave List).—**4.0 p.m.**, Concert by the Radio Ensemble, conducted by Johannesen, relayed from **Bergen, 824 kc/s, 364 metres:** Overture, Flotte Bursche (Suppé); Peasant Waltz (Krome); Hymn to the Sun (Rimsky-Korsakov); Pavane (Ravel); Scandinavian Suite (Torjussen); Canzonetta from the Violin Concerto (Tchaikovsky); Selection from The Land of Smiles (Lehár). **5.0**, French Lesson. **5.30**, Medical Talk. **6.0**, Announcements, Weather and News. **6.30**, Luther Festival Service, relayed from St. Saviour's Church. **8.0**, Literary Review. **8.30**, Foreign Market Report. **8.40**, Weather and News. **9.0**, Topical Talk. **9.15**, Popular Songs by the Pauline Hall Quintet. **9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.**, Le Journal Parlé. **7.30**, Les Paysages—Musical Programme. **8.0**, Political Talk **8.15**, Sganarelle—Comedy in One Act (Molière). **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN; 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.**, Aria from Hérodiade (Massenet), on Gramophone Records. **7.5**, Sponsored Talk. **7.15**, Le Journal Parlé. **7.30**, Pianoforte Sonata (Dukas), played by Marcel Jacquinot. **7.55**, Review of the Week. **8.0**, Talk on Music. **8.30**, Ta Bouche —Operetta in Three Acts (Yvain). **10.30**, News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.**, Physical Culture. **7.30**, Weather and Physical Culture. **7.45**, Gramophone Music. **8.0**, Press Review and Weather. **12 Noon**, Jewish Address: The Jewish Youth of To-day. **12.30 p.m.**, Gramophone Concert. Part I: Schubert Music. Marche militaire; Ständchen; Moment musical; Ballet Music from Rosamunde; Erlkönig: Death and the Maiden; The Trout; The Unfinished Symphony. Part II: Music and Mythology. Le rouet d'Omphale (Saint-Saëns): Extract from Sylvia (Delibes); Aria from Thaïs (Massenet); Selection from Orpheus in the Underworld (Offenbach); Dionysiaques (Schmitt); Extracts from Philémon et Baucis (Gounod); Divertissement and Greek Dance from Les Erynnies (Massenet). In the interval at **1.0**, Exchange and Weather and at **1.30**, Exchange. **2.0**, Exchange. **3.45**, Market Prices. **4.30**, Elementary English Lesson. **6.20**, Agricultural Talk: The Wheat Crisis from the Technical Point of View. **6.45**, Assurance Societies' Report. **7.0**, Talk: The Modern Novel. **7.20**, Gramophone Music. **7.35**, Popular Concert. **8.0**, Reading. **8.30**, News and Weather. **8.40**, Gastronomic Review. **8.45**, Concert of Chamber Music by the Radio Paris Quartet—Tenenbaum, Krettly, Yvonne Pascal and Lucienne Radisse: String Quartet No. 5 (Beethoven); Songs (Schumann); Pianoforte Solos (Chabrier): (a) Impromptu, (b) Feuillets d'album, (c) Balle Bille, (d) Bourrée fantasque; Songs; Quintet (Florent Schmitt). In the interval at **9.15**, Press Review and News.

PITTSBURGH

KDKA; 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.**, Musical Originalities, from **New York.** **7.30**, KDKA Home Forum.

NOV. 10th FRIDAY continued

8.0, Programme to be announced. 8.15 to 9.30, **New York** Relay. 8.15, Utility Hall. 8.30, Words and Music. 8.45, Morin Sisters. 9.0, Betty and Bob. 9.15, Gene Quaw's Orchestra. 9.30, News and Markets. 9.45, Arcadians, from **New York**. 10.0, Uncle Tom and Betty, from **New York**. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from **New York**. 10.45, Orphan Annie, from **New York**. 11.0, News-Reeler; Pat Haley. 11.15, Sports; Programme Preview. 11.30, Evensong. 11.45, Lowell Thomas, from **New York**. 12.0 **Midnight**, Amos 'n' Andy, from **New York**. 12.15 **a.m. (Saturday)**, Silver Toppers. 12.30 to 3.30, **New York** Relay. 12.30, Circus Days. 12.45 Irene Rich for Welch. 1.0, Popular Programme. 1.30, Dangerous Paradise. 1.45, Red Davis. 2.0, Let's Listen to Harris. 2.30, Variety Programme. 3.0, U.S. Army Band.

PORSGRUND.—See **Oslo.**

POZNAN

POLSKIE RADIO, 897 kc/s, 334.4 metres; 1.5 kW.—**6.5 p.m.,** Miscellaneous Items. 6.20, Hints for the Week End. 6.25, See **Warsaw.** 6.40, Programme Announcements. 6.45, See **Warsaw.** 9.40, Time and Sports Notes. 9.50, Dance Music on Gramophone Records. In the interval at 10.0, Aviation Weather Report and Police Notes, relayed from **Warsaw.** 10.30 (approx.), Close Down.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Moravská-Ostrava.** 3.55, Talk: Ancient Buildings of Alsace. 4.5, Concert by the Ondricek Quartet. 5.5, Market Prices. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Talk: Martin Luther. 6.0, Time and News. 6.10, English Lesson. 6.25, Mendelssohn Duets—Recital by Matysova-Svecena and Pecikova: Psalm from Elijah; Psalm from Lobgesang; Three Songs; Herbstlied. 6.45, Topical Talk. 7.0, See **Moravská-Ostrava.** 7.30, The Escape from Elba, from the Napoleonic Trilogy—Radio Play (Kyser). 9.0, Time and News. 9.15, News in Russian.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from **Lausanne**). Concert by the Small Radio Lausanne Orchestra, conducted by Moser. 12 **Noon** (from **Lausanne**), Financial Notes. 12.10 **p.m.** (from **Lausanne**), Concert (contd.). 1.0 to 2.58, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, See **Schweizerischer Landessender.** 5.0 (from **Geneva**), Programme for Women. 5.30 (from **Geneva**), Esperanto Lesson. 5.40 (from **Geneva**), English Lesson. 6.5 (from **Geneva**), Talk on Bridge. 6.20 (from **Geneva**), Talk for Chess Players. 6.35 (from **Geneva**), Illustrated Talk: Newly released Gramophone Records. 6.59 (from **Geneva**), Weather Report. 7.0 (from **Geneva**), Talk: Art and Life—Portraits. 7.20 (from **Geneva**), Chamber Music by the Appia Quartet: Quartet No. 40 in G (Haydn); Quartet No. 2 (Borodin). 8.5 (from **Geneva**), Humorous Programme. 8.25 (from **Geneva**), Military Band Concert, conducted by Hoogstoel. 9.0, News and Weather. 9.10 (approx.), Close Down.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**6.20 p.m.,** Song and Pianoforte Recital of Latvian Music. 7.0, News. 7.20, Orchestral Concert, conducted by Parups. 8.0, Weather and News. 8.15, Concert of Operetta Music. 9.0 (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.;** and **2RO, 25.4 metres.**—**11.30 a.m.,** Gramophone Music. 12 **Noon** to **1.15 p.m.,** Orchestral Concert. In the intervals at 12.30, Giornale Radio and Exchange, and at 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15 to 5.0, Vocal and Instrumental Concert. 5.40 **(Naples),** Shipping and Sports Notes. 5.45, Dopolavoro Announcements and Tourist Report. 5.57, Report of the International Institute of Agriculture (in Spanish, German and French). 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements, and Sports Notes. 7.15, Sponsored Concert. 8.15, Talk. 8.30, Tenor Song Recital by Emilio Livi: Airs from (a) La Favorita (Donizetti), and (b) The Pearl Fishers (Bizet); Song (De Curtis); Bimba, bimbetta (Sibella); Air from I Pagliacci (Leoncavallo). 8.45, Programme to be announced. 10.0, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW.—Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.**—**7.30 to 8.30 p.m.** (approx.), **New York** Relay. 7.30, Echoes of Erin. 7.45, Sonata Recital. 8.0, Three Shades of Blue—Male Trio. 8.15, Soloist. 12.45 **a.m.** (Saturday), Stock Reports. 1.0 to 4.0, **New York** Relay. 1.0, Cities' Service Concert. 2.0, Fred Allan and Ferde Grofe's Orchestra. 2.30, Victor Young's Orchestra. 3.0, Dramatic Programme. 3.30, Lum and Abner's Friday Night Sociable. 4.0, Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.: **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. 11.0 (from **Basle**), Songs and Yodels on Gramophone Records. 11.29, Time Signal from Neuchâtel Observatory, Weather and News. 11.40 (from **Basle**), Concert with Jazz Music. Conductor: Carl Thoms. 12.25 **p.m.** (from **Basle**), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from **Zürich**), Talk for Women. 3.0 (from **Zürich**), Concert by the Radio Orchestra. 4.0, Gramophone Music. 4.10, Concert by the Small Station Orchestra, conducted by Scherbaum. 5.0 (from **Zürich**), Gramophone Concert. 5.30 (from **Berne**), Talk: The Freedom of Literature. 6.0 (from **Berne**), Time, Weather, Market Prices, Tourist Notes, Sports Results and Announcements. 6.20 (from **Berne**), Theatre Talk. 6.50, Concert by the Radio Orchestra. 7.25 (from **Berne**), Violin and Harpsichord Recital of Old Classical Music. 8.0, Weather and News. 8.10 (from **Berne**), Fifteen Years Ago—A Radio Sequence. 9.20 (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**4.5 p.m.** (from **Göteborg**), Concert of Light Music: Overture, Raymond (Thomas); Waltz (Kratzl); Schubert Potpourri (arr. Urbach); Waltz (Sylvain); 'Cello Solo, Serenade (Haydn); Song Potpourri (Dostal). 5.0, Talk: Impressions of Stockholm. 5.30, Four Songs without Words for Pianoforte (Mendelssohn). 5.45, Legal Talk. 6.15, Weather and News. 6.30, Programme for the 450th Anniversary of Luther's Birth: The Reformation Cantata (Bach) and Address. 7.45, Talk. 8.15, Songs to the Lute by Vilhelm Julinder. In the interval, Guitar Solos by Bo Peters. 8.45, Weather and News. 9.0, Gramophone Records of Variety Music. 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Classical Music on Gramophone Records. 12.45 **p.m.,** News. 1.0, Time and Exchange. 1.5, Variety Music on Gramophone Records. 2.0, Interval. 4.45, Literary Talk: Madame de Maintenon. 5.0, Orchestral Concert, conducted by Ro-kam. 6.0, Trio Concert, relayed from **Lille, 1,130 kc/s, 265.4 metres.** 7.0, Topical Talk in German. 7.15, Talk: The Scout Movement. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Mademoiselle Nom d'un pipe—Operetta in Three Acts (Cuvillier). In an interval at 9.30 (approx.), Press Review. 10.30 (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.25 p.m.,** Local News and Weather. 12.35 to 1.30, Gramophone Concert. 2.0, Concert of Wind Instrument Music. Parade March; Waltz, Nachtschwärmer (Ziehrer); A Wedding Day on Troldhaugen (Grieg); Overture, Maritana (Wallace); Erinnerungen an Josef Strauss (Fetras); Bleisoldaten (Eckert); Der alte Berner. 3.0, See **Frankfurt.** 5.0, See **Langenberg.** 5.40, Time, Agricultural Report and Weather. 6.0, Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** 7.0, See **Frankfurt.** 7.10 to 9.0, See **Langenberg.** 9.0, See **Frankfurt.** 9.20, What you should know. . . . 9.30, Local News, Weather and Sports Report. 9.45 to 11.45, See **Frankfurt.** 11.45 (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. 6.15, Accordion Music. 6.30, Light Music. 6.45, Orchestral Music. 7.0, Medical Talk. 7.10, Operetta Music: Arias from Passionnément (Messager), La belle Hélène (Offenbach), La tulipe noire (Tiarko), and Oh Papa (Yvain). 7.15, News. 7.30, Ballet Music from Isoline (Messager), by the Symphony Orchestra. 7.45, Chansonnettes. 8.0, Military Music. 8.15, Opera Music: Duet from Act II of Rigoletto (Verdi); Arias from Werther (Massenet), Lakmé (Delibes), and Mignon (Thomas). 8.30, Orchestral Concert: Ständchen (Heykens); Solveig's Song (Grieg); Wiegenlied (Brahms); The Sanctuary of the Heart (Ketelbey); Napolétana (Popezki); Noel de Pierrot (Monti); Gavotte from Mignon (Thomas); Volga Song Melody. 9.0, Concert of Music by Gabaroche. 9.30, Opera Music: Prelude to Act IV of Carmen (Bizet); Prelude to Cavalleria rusticana (Mascagni); Prelude to Werther (Massenet); Entr'acte from Act III of Lakmé (Delibes); Overture, Manon (Massenet). 9.45, Music from Sound Films. 10.0, Accordion Music. 10.15, News. 10.30, Concert for Listeners in Morocco: Part I, Viennese Orchestral Music; La plus légère (Messier); La buissonnière (Walrance); In the Tea Gardens of Ceylon (Yoshitomo); Waltz, Les sirènes (Waldteufel). Part II, Light Music: Enchantement (Massenet); La délaissée (Hahn); T'aimer (Daris); Sois heureuse (Danidery). 11.0, Operetta Music: Overture, The Drum Major's Daughter (Offenbach); Selection from Rip (Planquette); Selection from Les cloches de Corneville (Planquette). 11.15, Dance Music. 12 **Midnight,** News. 12.5 **a.m.** (Saturday), Chansonnettes. 12.15, Music by an Argentine Orchestra. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.,** Chamber Music. Concert by Laura L. Razza (Violin), and Laura Margon (Pianoforte): Sonata for Violin and Pianoforte (Franck); Pianoforte Solos: (a) Scherzo (Martucci), (b) Tango (Anthéil), (c) Old Vienna (Castelnuovo-Tedesco); Violin Solos: (a) Waltz, La plus que lente (Debussy), (b) Capitan Fracassa (Castelnuovo-Tedesco). 5.0 till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

BEETHOVEN FROM RADIO-PARIS. Lucienne Radisse, the 'cellist in Beethoven's String Quartet, No. 5, to be broadcast from Radio-Paris at 8.45 p.m.

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m. (Florence** only), Pianoforte Recital by Jacqueline Marcault: Toccata and Fugue (Frescobaldi); Suite in G (Scarlatti); Three Preludes (Scriabin); Three Etudes (Chopin). 5.0 to 5.5, Weather. 5.40, Giornale Radio. Dopolavoro Notes and Gramophone Music. 6.0, Time, Report of the Geographical Society, and Gramophone Music. 6.10, Market Prices. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, News, Giornale Radio, and Weather. 7.15, Sponsored Music. 7.45 (approx.), Comedy in Three Acts. 9.0 (approx.), Dance Music. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres** (Evening); 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in German. 7.0 to 7.15 **p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: Overture, The Merry Wives of Windsor (Nicolai); Es flüstert die Liebe (Lindemann); Preludes to Carmen (Bizet); Fantastic Waltz, Aeroplane (Mankomaski); Glockengavotte (Lehner); Johann Strauss Potpourri (Korngold). 12 **Noon,** Time and Weather. 12.10, Concert (contd.): Symphonic Polonaise (Bass); Five Old Viennese Tone Pictures (Bass); Serenade in E (Bass); Josephine Waltz (Bass); German March Potpourri (Blankenburg); Turkish Legends (Lincke); Song, Two Hearts and a Waltz Refrain (Stolz); Auch du wirst mich einmal betrügen (Stolz); Potpourri, Fortissimo (Kalman). 2.0, Time, Weather and Exchange. 2.20, Talk: The Chicken Run in Winter. 2.30, Programme for Children. 2.55, Songs and Duets from Operettas on Gramophone Records; Song from Eine Frau, die weiss, was sie will (O. Straus); Duet from Der Rastelbinder (Lehár); Two Songs and Foxtrot from Eine frau, die weiss, was sie will (O. Straus); Tango, from Die Dame mit dem Regenbogen (Gilbert) Serenade from Die schöne Galathee (Suppé); Mutterlied from Schützenliesel (Eysler); March Foxtrot from Die Dame mit dem Regenbogen (Gilbert); Song from A Waltz Dream (O. Straus); Song from Der lachende Ehemann (Eysler); Song from The Czarevitch (Lehár). 3.30, Talk for Women. 3.55, Talk: The Memorial in St. Stephen's Church. 4.15, 'Cello and Pianoforte Recital by Beate Reichert and Otto Schulhof 'Cello and Pianoforte Sonata (Sammartini); 'Cello and Pianoforte Sonata in G minor (Rachmaninov). 4.55, Traffic Report. 5.10, Talk. 5.25, Sports Talk. 5.35, Talk on Architecture. 6.0, Pianoforte Recital by Boleslav Kon: Prelude and Fugue in D (Bach-Busoni); Fantasia in C, Op. 17 (Schumann); Ballad in G minor (Chopin); Three Etudes from Op. 10 (Chopin); Nocturne in C minor (Chopin); Polonaise in A flat (Chopin); Variations in B minor, Op. 3 (Szymanowski). 6.50, Time, Weather and Programme Announcements. 7.0, Topical Talk. 7.30, Concert of Viennese Music by the Wiener Symphoniker, conducted by Josef Holzer, and the Pepi Wichart Folk Music Quartet. Soloist: Maria Gerhart (Soprano); Overture, Die Fledermaus (Joh. Strauss); March, Servus Wien (Eysler) Soprano Solo: From The Countess from Chicago (Kalman); Quartet: Frühling in Wien (Stolz); Waltz, Neu Wien (Joh. Strauss); Soprano Song from The Land of Smiles (Lehár); Songs from Lilac Time (Schubert-Berté); Trumpet Solo: Mir hat amol von Himmel traut (Kratzl); Selection from Waltzes from Vienna (Strauss-Pittner-Korngold). Quartet: Das Lercherl von Hernals, from Hoheit tanzt Walzer (Ascher); Quartet: Geh, mach dei Fensterl auf (Jurek); Herein-paziert from Der Schätzmeister (Ziehrer); Quartet: Wien, wer deine blonden Frauen küsst (Engel-Berger); Soprano Solo: Geh'n ma hutschen from Hanni geht tanzen (Eysler); Soprano Song: Im Schönbrunner Park (O. Straus); March, Weana Früeht' en (Wagner). In the interval at 8.30, News. 9.15, Announcements. 9.30, Light Music on Gramophone Records. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Review of Music, relayed from **Lwów, 788 kc/s, 381 metres.** 11.30, Radio Journal. 11.35, Weather. 11.38, Review of Music (contd.). 12.0 **Noon,** Interval. 2.30 **p.m.,** Economic Notes. 2.40, Announcements. 2.45, Boy Scouts' Report. 2.50, Naval and Colonial Report. 2.55, Light Music. 3.40, Book Review. 3.55, Pianoforte Recital. 4.25, Song Recital, relayed from **Poznan, 896 kc/s, 335 metres.** 5.50, Agricultural Press Review relayed from **Wilno, 533 kc/s, 563 metres.** 5.0, Talk, relayed from **Cracow, 959 kc/s, 312.8 metres.** 5.20, Light Music, relayed from the Gastronomia Café: Hungarian Fantasia (Popper); Scherzo-Waltz (Strauss); Tango (Abalos); Habanera (Barritza); Slow Foxtrot (Gornez-Herburg); Foxtrot (Plessow); Melody (Leoncavallo); Waltz (Durand); Spanish Serenade (Bizet); Please (Rainger); Foxtrot (Noble). 6.5, Miscellaneous Items. 6.20, Hints for the Week-end. 6.25, Topical Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Talk on Music. 7.15, Concert by the Warsaw Philharmonic Orchestra, conducted by Bierdjajew; Soloist, Joseph Manowarda (Songs); Overture, Le Carnaval romain (Berlioz); Songs: (a) Hanz Sachs' Monologue from The Mastersingers (Wagner), (b) Good Friday Music from Parsifal (Wagner); Symphonic Poem, Don Juan (Richard Strauss); Songs: (a) Two Arias from The Valkyrie (Wagner), (b) Two Arias from The Mastersingers (Wagner). In the interval at 8.0, Talk: Freedom in Literature. 9.40, Sports Notes. 9.50, Sound Film Music (on Gramophone Records). 10.0, Aviation Weather Report and Police Notes. 10.5, Gramophone Music (contd).

WILNO

530 kc/s, 566 metres; 16 kW.—**6.5 p.m.,** Topical Talk. 6.20, Miscellaneous Items. 6.25, See **Warsaw.** 6.40, Programme Announcements. 6.45 till Close Down, See **Warsaw.**

ZAGREB

YUGOSLAVIA, 977 kc/s, 307 metres; 0.75 kW.—**6.30 p.m.,** Announcements and News. 7.0, Pantsche Wladigerov Pianoforte Recital by the Composer, relayed from **Belgrade, 698 kc/s, 429.7 metres.** 7.40, Chamber Music by the Brandl Trio. 9.0, News, Weather and Programme Announcements. 9.15, Dance Music relayed from the Grill Room. 10.0 (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender**

SATURDAY

NOVEMBER THE ELEVENTH

ALGIERS

825.5 kc/s. 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes. **7.15,** Agricultural Report and Weather. **7.20,** Sound Film Music. **8.0** Time. **8.2,** Lottery Results. **8.10,** Concert by the Station Orchestra: Torch March, No. 3 (Meyerbeer); Selection from L'attaque du Moulin (Bruneau). **8.35,** News. **8.40,** Arias from Manon (Massenet). **8.40,** Concert (contd.): Marche lorraine (Ganne); Kaiserwalzer (Strauss); Nuits algeriennes (Gregh); March (Ancliffe). **9.30,** News. **9.35,** Songs. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.**—**1.30 to 2.30 p.m.,** Time, Weather, Stock Report and Gramophone Music. **6.0,** Gramophone Concert. **6.45,** News. **7.0,** Travel Talk. **7.15,** Gaelic Lesson. **7.30,** Time Signal. **7.31,** Irish Music by the Station Orchestra. **7.45,** Gaelic Songs. **8.0,** Traditional Fiddle Music by Tadgh Small. **8.15,** The Station Orchestra. **8.30,** The Proposal—Play (Tchekov), by Gabriel Fallon and Company. **9.0,** Contralto Solos by Florence Howley. **9.15,** The Station Orchestra. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Dance Music: Looking Forward; I can't forget the Night we met; Niagara Moon; I've got to sing a Torch Song. **9.45,** Military Band Music: Waldmere March (Losey); En promenade (Gillet); No. 1 from Wayside Sketches (Scott-Minchin); Reminiscences of Ireland (Godfrey). **10.0,** Concert of Dance Music: Dixie Doorway; My Moonlight Madonna; Remember my Forgotten Man; Let's call it a Day; You're mine, you; The Shadow Waltz; Dancing Butterfly. **10.30,** I.B.C. Goodnight Melody. **10.31,** News and Weather. **10.40,** Uilleann Pipes. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Programme for Children. **7.0,** Request Gramophone Records. **7.30,** Exchange and Market Prices, followed by Request Gramophone Records (contd.). **8.0,** Gramophone Music. **8.15,** Anti-War Talk. **8.30,** Catalan Educational Programme: History and Geography Lesson. After the Programme, News. **9.0,** Chimes, Weather, Exchange and Market Prices. **9.5,** Educational Programme. **9.35,** Concert by the Radio Orchestra: Dance of the Apprentices from The Mastersingers (Wagner); Hungarian Dance No. 4 (Brahms); Suite, El secret de Myrto (Berardi). **10.30,** Dance Music relayed from the Casa Llibre. In the interval at **11.0,** News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Children. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**5.55 p.m.,** Time and Programme Announcements. **6.0,** Sonata for 'Cello (Chopin). **6.30,** Gramophone Music. **7.0,** Concert, relayed from **Ljubljana. 8.0,** Concert by the Radio Orchestra. **8.40,** Popular Song Recital by Mile Milutinovic. **9.10,** Time and News, followed by Dance Music, relayed from the Automobile Club.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**1.0 p.m.,** Gramophone Concert: Caucasian Suite (Ippolitov-Ivanov); Manchurian Sketches (Glan); Two Pieces from the Suite, Alt China (Niemann): (a) Die heilige Barke, (b) Feest im Garten. **1.30,** The Day's Watchword. **1.35,** Gramophone Concert (contd.): Norwegian Dances (Grieg); Russian Dances (Bullerian); Slav Dance (Chabrier); In a Persian Market (Ketelbey); Doina. **2.0,** Handwork for Children. **2.30,** Weather and Exchange. **2.45,** Talk. **3.0,** See **Hamburg. 4.0,** Weekly Sports Review. **4.20,** Orchestral Concert. **5.0,** The Day's Watchword. **5.5,** The Red Terror in Munich—Radio Sequence (Werner Plücker). **5.30,** Gramophone Records: Air from a German Requiem (Brahms); Funeral March from Samson (Händel). **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** To-day's Motto. **7.10 to 9.0,** See **Frankfurt. 9.0,** News and Sports Notes. **9.45,** Weather. **10.0, Berlin (Deutschlandsender)** and **Hamburg** Exchange Programme. Dance Music. **11.30** (approx.), Close Down.

BERLIN

FUNKSTUNDE; 715 kc/s, 419.5 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.**—**2.50 p.m.,** Concert by the Julius Tomsen Orchestra and the Station Choir, conducted by Heinzkarl Weigel: Waltz, Was der Wald erzählt (Zimmer); Selection from Boccaccio (Suppé); Arabisches Gold (Rust): Scheherazade (Schmalstich); Waltz, Marienklänge (Joh. Strauss); Selection from Die schöne Galathee (Suppé); Choral Selections: (a) Der Gondelfahrer (Schuber(), (b) Wie wundersam (Stieler), (c) Der Bach (Gretscher), (d) Chorus from Rosamunde (Schubert); Overture, The Princess in the Golden Slippers (Rust); Valse Berceuse (de Micheli); Dance of the Butterfly (Rassel); Selection from Gasparone (Millöcker); Waltz, Herbststimmung (Lincke). In the interval at **4.0** (approx.), Report on the Hockey Match for the Silver Shield. **4.40,** A Radio Sequence. **5.0,** Contralto Song Recital by Eleanor Schlosshauer. Part I, Händel: Ohne Trost, from Julius Caesar; Dank sei Dir, Herr. Part II, Brahms: Der Tod, das ist die kuhle Nacht; Sapphische Ode; Regenlied; Botschaft. **5.25,** The Day's Watchword. **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations; Symphony in C Sharp Minor, Op. 22 (de la Motte Fouqué).by the Station Orchestra, conducted by Otto Frickhoeffer. **7.5,** Concert of Light Music. **9.0,** News and Sports Notes. **9.15** (approx.), Gramophone Concert. **11.30** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**7.0 p.m.,** Radio Journal. **7.55,** Sports Talk. **8.0,** News and Racing Results. **8.5,** Gramophone Music. **8.30,** Armistice Day Concert by the Symphony Orchestra and Soloists.

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**6.15 p.m.,** Talk for Housewives. **5.30,** Gramophone Music. **5.45,** Topical Talk. **5.55,** Report for Housewives. **6.0,** See **Prague. 9.15,** Concert by the Station Orchestra, conducted by Dyk. Soloists: Hoza (Tenor), Beza (Piccolo) and Mraz (Bassoon). Overture (Mach); Tenor Solos from The Land of Smiles (Lehár) and Paganini (Lehár); Czech National Songs (Leopold); Two Tenor Airs from The Czarevitch (Lehár); Minuet (Vackar); Song (Joh. Strauss-Körngold); Waltz (Nedbal); Love Song (Tagliaferri); Bassoon Solo: Polka (Fucik); Waltz (Sykora-Aust); Polka (Fiipovsky); Piccolo and Bassoon Duet (Landl); Polka (Vacak); March (Fucik). **10.30** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**12 Noon,** Weather. **12.5 p.m.,** Gramophone Concert. In the interval at **12.45,** Time and News. **1.40,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices. **2.15,** Talk on Heroism. **2.35,** Review of the Week's Films. **2.55,** Talk: Programmes for the Coming Week. **3.5,** Concert by the Station Orchestra, conducted by Gerhard Ewald Rischka. Introduction to the Third Act and Bridal Chorus from Lohengrin (Wagner); Selection from Martha (Flotow); Poetic Suite (Dvorák); Overture on Silesian Folk Songs (Koschinsky);; Selection from Pandora (Strecke); Gruhenlichter-Walzer (Zeller); Selection from Filmzauber (Kollo-Bredschneider). **4.40,** Talk: The Red Terror in Munich. **5.0,** The Day's Watchword. **5.5,** Concert by the Silesian Hitler-Jugend Choir. **5.30,** Programme to be announced. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** Programme to be announced. **9.0,** Time and News. **9.30,** Gramophone Concert. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News followed by Violin and Harpsichord Recital. **6.0,** See **Prague. 6.25,** Concert by the State Police Band, conducted by Chládek. **7.10,** Reading. **7.25,** Flute and Guitar Music. **7.45,** A Play in Four Scenes (Jerabek). **8.25,** Gramophone Music. **9.0,** See **Prague. 9.15,** See **Bratislava. 10.30** (approx), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans: March, Sambre et Meuse (Planquette); Overture, Patrie (Bizet); Scènes alsaciennes (Massenet); Three Marches on Gramophone Records; English Song Potpourri, The Bing Boys are here (Ayer); Marche de la garde consulaire à Marengo (Chomel); Auprès de ma blonde (Labbé); Marche lorraine (Ganne). **1.0 p.m.,** Le Journal Parlé. **1.10,** Dance Music. **5.0,** Concert from the Century Hotel, Antwerp. **6.0,** Talk: The Anniversary of the Signing of the Armistice. **6.15,** Gramophone Concert: Overture, Oberon (Weber); Heroic Symphony (Beethoven); Cantique de victoire (Honegger). **7.30,** Wireless Notes. **8.0,** Concert by the Radio Orchestra, conducted by Franz André: Marche héroïque (Saint-Saëns); Funeral March (Beethoven); Gramophone Record, Elegiac Melody (Grieg). **8.30,** The Peace—Play (Aristophanes), with Music by Franz André. **9.30,** Concert (contd.): Fanfare from La Péri (Dukas); Le délnge (Saint-Saëns); Slav March (Tchaikovsky). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—**12 Noon,** Dance Music. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: Secular Prelude, 1930 (Leemans); Mijn Moederspraak (Benoit); Cramignon (Gilson); Ballet Music from Milenka (Blockx); Shree Marches on Gramophone Records; Valse militaire belge (Frémaux); Bunkey-Doodle-I-doh; March, Liberty Bell (Sousa). **5.0,** Concert by the Symphony Orchestra, conducted by Jean Kumps: Ronde wallonne (Jongen); Nocturne (Brenta); Musiquette (Poot); Extract from Polyeucte (Tinel); Two Sketches (Soudant): (a) Quiétude, (b) Fantasia; Prelude (Andelhof); Dance Suite (Brumagne). **6.0,** Gramophone Records: Etudes for Choir (De Vocht); Jazz Music (Poot); Heldencantate (De Vocht). **6.15,** Talk: The Beginning of the World in Myth and Legend. **6.30,** Concert by the Little Station Orchestra, conducted by Leemans: Rubens marche (Benoit); Marche du premier consul (Paisiello); Scènes brabançonnes (Sarly); Gramophone Records; Flute Solo; Scherzo, Fanfaluca (Gilson); March of the French Guards (Wettge); Kermesse flamande (De Taeye); Verzuchting (Opsomer); March, Merkem (Hupperman). **7.30,** Film Review. **8.0,** Concert by the Symphony Orchestra, conducted by Jean Kumps: Faestklanken (Verheyden); Intermezzo (Candael); Springdanz (De Greef); Fantasia on Angevins Airs (Leken); Romance for Violin and Orchestra (Vreuls); Two Basque Airs (Kumps); Flemish Dance (Blockx); Canadian Fantasia (Gilson); Two Pieces for Violin and Orchestra (Rasse); Habanera and Waltz (Maes); Feu d'artifice (Schoemaker); 'Cello and Orchestra: Mijn Moederspraak (Benoit); Walloon Rhapsody (Ysaye). In the intervals, Recitations and De Blinde Muur—Radio Play (Bergman). **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Modern Music by the Corologos Jazz Band. In an interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** 'Cello Recital by Lupu. **7.30,** Talk. **7.45,** Song Recital. **8.15,** Concert by the Krentzer Schrammel Quartet: Heurigen Bruder (Fucik); Geh, Alte schau (Schubert-Berté); Piece (Schmidt); Wiener Weisen auf Reisen (Reckenwald); Die Musik kommt (Schild). **8.45,** Radio Journal. **9.0,** Romanian Music by the Station Orchestra.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **6.0 p.m.** (approx.) till Close Down.—**4.45 p.m.,** Concert by the Stefan Bertha Orchestra. **5.30,** The Letter Box. **6.0,** Concert of Cigány Music. **7.0,** Vocal and Instrumental Concert. **8.0,** Concert by the Franz Liszt Music Society, from **Sopron. 9.20,** News. **9.40,** Gramophone Music.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres.**—**11.0 a.m.,** Time and Chimes from the Town Hall. **11.15,** Talk and Reading: Henrik Ibsen. **11.45 to 1.0 p.m.,** String Ensemble Concert, relayed from the Wivex Restaurant. **2.0,** Concert by Mogens Hansen's Instrumental Ensemble. Soloist: Edel Andersen (Songs). Italian Comedy Overture (Kéler-Béla); Waltz (Ackermans); Russian Gipsy Song (Artemiew); Triumph der Schönheit (von Blon); La mélancolie (Bull); Selection from Revanche (Jascha); Songs; The Tyrol in Song and Dance (Fétras); Selection from Les Cloches de Corneville (Planquette); Sérénade badine (Gabriel-Marie); Promenade à l'étang (Schmitt); Viennese Waltz (Burell); March, The Honeymoon (Rosey). **4.0,** Gramophone Music. **4.30,** Exchange and Fish Market Prices. **4.45,** Technical Talk. **5.15,** French Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.20,** Talk: Viennese Classical Music. **6.50,** Concert by the Station Orchestra. **7.30,** Concert by a Workers' Choir, relayed from the Odd Fellows' Hall. Soloists: Gunder Knudsen, Poul Wiedermann and Frederiksen. **8.45,** Reading. **9.0,** News. **9.15,** Concert by the Station Orchestra, conducted by Fritz Mahler: Overture, Die Fledermaus (Joh. Strauss); Waltz from Der Rosenkavalier (R. Strauss); Die Soubrette (Jos. Strauss); Polka-Mazurka, Die Schwätzerin (Jos. Strauss); Deutschmeister Jubilaeumsmarsch (Joh. Strauss); Waltz (Joh. Strauss, Sen.); Overture, Light Cavalry (Suppé); March from The Gipsy Baron (Joh. Strauss). **10.0,** Dance Music, relayed from the Ritz Restaurant. In the interval at **11.0,** Time and Chimes from the Town Hall. **11.15** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**6.5 p.m.,** Talk on Present Events. **6.20,** Miscellaneous Items. **6.25,** See **Warsaw. 6.40,** Programme Announcements. **6.45,** See **Warsaw. 9.45,** Sports Notes. **9.55,** See **Warsaw. 10.0,** Humorous Programme, relayed from **Lwów, 788 kc/s, 381 metres. 11.0,** See **Warsaw. 11.15** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**10.55 a.m. till 12 Noon,** Programme in English by the I.B.C. Happy Hour, Part 1: Special Armistice Day Broadcast: Signature Tune; March, Old Comrades (Teike); Two Minutes' Silence; Abide with me (Liddle); The Standard of St. George (Alford); Scottish Patrol (Williams); Land of my Fathers (James); Tipperary (Judge Williams); Selection of War Marching Songs; Naval Patrol (Williams); Land of Hope and Glory (Elgar). Part II: Veleta Medley (Varney); Friend o' Mine (Sanderson); Alice Blue Gown (Tierney); Morning aboard the "Saucy Sue"; Destiny Waltz (Baynes); Another little Drink (Lester); Somewhere a Voice is calling (Tate); Snacks in Bars Selection (Egerer). **12 Noon,** Programme in French. **4.30 to 6.0 p.m.,** Programme in English by the I.B.C. **4.30,** The I.B.C. Nursery Corner. **5.0,** Concert for Tunbridge Wells and Isle of Thanet: Signature Tune: The Night by the Sea; Colonel Bogey (Alford); Ballad Memories (Baynes); Song: Stonecracker John (Coates); On the Quarter Deck (Alford); Old 'Arry; Song: Route Marching (McCall); The Policeman's Holiday (Ewing); Selection from Cavalcade (Coward). **5.30,** Banjo Solos for Dover and Folkestone: In the Moonlight (McHugh); Finger Tricks (de Pietro); Song: My Darling (Heymann); St. Louis Blues (Hardy). **5.45,** Dance Music: Happy Ending; Snowball; Nunca; The Last Round Up. **6.0,** Programme in French. **11.0** till Close Down. Programme in English by the I.B.C. **11.0,** Talkie Time. Tunes from the Talkies: Signature Tune: Sittin' in the Dark; Selection from The Kid from Spain (Kalmar); Shuffle off to Buffalo (Dubin); In a Year, in a Day (Heymann); Butterfly Song (Strauss); Waltz Time Medley (Strauss); After the Ball (Harris); There's something about a Soldier (Gay); Shadow Waltz (Dubin); Signature Tune. **11.30,** Concert by the International Broadcasting Company (Ireland), Ltd.: Signature Tune: Come back to Erin; Waltz, Gold and Silver (Lehár); Around the Volga (Borchert); Rose of Tralee (Spencer); Bells across the Meadow (Ketelbey); Shamrockland (Stodden); Mignonette (Friml); Waltz from The Gipsy Princess (Kálmán); Signature Tune: Come back to Erin. **12.5 a.m. (Sunday),** Late News Bulletin in English. **12.10** (approx.), Club Concert for Loch Lomond and District Listeners: Signature Tune: The Chum Song; Song: Loch Lomond (arr. Diack); Heebie Jeebies (Atkins); My Ain Folk (Mills); My Gal Sal (Dresser); On the Banks of Allan Water (Horn); The Wedding of Mr. Mickey Mouse (Pola); Cecilia Mia (Frontela); The Last Round Up (Hill); My Moonlight Madonna (Fibich); Shadows on the Swanee (Young); Oh Johanna (Lawrence); Goodnight, little Girl of my Dreams (Tobias); Morning, Noon and Night (Swanstrom); Signature Tune. **1.0,** Dance Music: Signature Tune: The Bells of Normandy; Don't blame me; Solitario Tango; Tick, Tock; Dinner at Eight; My Mother's Garden; Mary Rose; She's everybody's Sweetheart now; Happy as the Day is long; Sweetheart Darlin'; I'll show you off; Let's call it a Day; A Girl like Nina; Lazybones; Happy Ending; Mi Amor esta en el Valle; Isn't this a Night for Love; Signature Tune. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** See **Langenberg. 1.30 to 2.30,** See **Stuttgart. 2.30,** Weather. **2.40,** Time and Market Prices. **3.0 to 5.0,** See **Stuttgart. 5.0,** Gramophone Records. **5.50,** Weather, News, Programme Announcements and Time. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde).**

.0, Topical Talk. 7.10, Variety Concert. 9.0, Time and News. 9.20 to 1.0 a.m (Sunday), ce Stuttgart. 1.0 (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

406 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m.,** Concert by the Small Station Orchestra, conducted by Gerhard Maasz, relayed from the Ernst Merck Hall: Overture, Ein Operuball (Hoaberger); Waltz, An der schönen grünen Narenta (Komzak); Selection from Der Zenor de Herzogin (Künneke); Dance Suite (Mraczek); Catalan Rhapsody (Ailiout). **4.0,** Talk on the Reich Marine and Topical Talk. **4.30,** Variety Programme, relayed from the Radio Exhibition in the Ernst Merck Hall. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde),** Concert. **7.0,** Programme to be announced. **9.0,** Time and News. **9.30,** Variety Programme on Gramophone Records. **10.0, Berlin (Deutschlandsender)** and **Hamburg** Exchange Programme. Dance Music. **11.30** (approx.), Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—10.30 a.m.,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. Overture, The Secret (Dvorák); Serenade, Granada (Albéniz); Catalan Caprice (Albéniz); Selection from Madame Butterfly (Puccini); Bavarian Dances (Pachernegg); Viennese Operetta Music (Robrecht). **12.5 p.m.,** Radio Sequence. **12.20,** News. **12.30,** Gramophone Concert. Hohenfriedberger Marsch (Frederick the Great); Einmal am Rhein (Ostermann); Waltz, Dynamiden (Jos. Strauss); Potpourri Mosaik (Zimmer); Vorüber—vorbei (Schubert); Lied aus Wien (Schubert); Selection from the Gipsy Baron (Joh. Strauss); Gebirsweisen; Folk Song Potpourri, Was jeder kennt; Mainzer Narhalla-Marsch (Zulehner), In the interval at **1.0,** News. **1.30,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Market Prices and Exchange. **2.30,** Handwork Lesson. **2.55,** Talk. **3.0,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. Overture, Jessonda (Spohr); Selection from William Tell (Rossini); Suite, Old China (Niemann); Waltz, Ernst und Humor (Jos. Strauss); Die Spieluhr der Pompadour (Noack); Steirer Marsch (Noack); Königin Luise in Paretz (Leuschner); Suppé Fantasia (Rhode); Liebesworte (Zikoff); Overture, Cagliostro in Wien (Joh. Strauss). In the interval at **4.0** approx.), A.D.A.C. Traffic Report. **5.0,** Programme Announcements. **5.15,** Agricultural Prices. **5.20,** Talk. **5.25,** German Folk Songs by the Lobeda Choir. Lob der Musik (Ahle); Pomeranian Folk Song, Ich habe den Frühling gesehen (arr. Jendvai); Es waren zwei Königskinder (arr. Maier); Jütländisches Tanzlied (arr. Leudvai); Bavarian Folk Song, Donaustrudel (arr. Rein); Alsace Folk Song, Schwefelhölzle (arr Rein); South German Folk Song, Es wollt' ein Jägerlein jagen (arr. Rein). **5.55,** Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** News and Weather. **7.10,** Variety Programme. **9.0,** News and Sports Report. **9.30** (approx.), Gramophone Concert, relayed from **Berlin (Funkstunde). 11.30** (approx.), Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.** and 20 kW. from **5.40 p.m.—11.40 a.m.** till Close Down, Programme of the Workers' Radio Society (V.A.R.A.). **11.40 a.m.,** Concert by the Small Station Orchestra, conducted by de Groot: Les jeunes filles d'Amérique (Duganne); Der Himmel voller Geigen (Ziehrer); Erotica (Grieg); Norwegian Dance (Grieg); Hört, hört (Morena); Gramophone Music: Parade des Éléphants (Basque); Puppe und Hampelmann (Armandola); Moroccan Wedding (Billi); Monte Cristo (Kotlar); Hungarian Dances (Brahms); Melody (Michiels); Gramophone Records: Melody (Gaveaux-Renes); Selection from A Kiss in Spring (Kalman); Leggenda d'amore (Becce); Destiny (Baynes); In der Heinzelmännchen-Bar (Rosen); Selection from The Tales of Hoffman (Offenbach). **1.40,** Interval. **1.55,** Gramophone Music. **2.30,** Talk on Teetotalism. **2.50,** Concert by the Amsterdam Orchestral Society, conducted by Diepenbeek: March, Ernst August (Blankenburg); Overture, The Merry Wives of Windsor (Nicolai); Frühlingserwachen (Nicolai); Idyll, Hiawatha (Moret); Am Neckarstrand (Millöcker); Gramophone Records: Romantic Overture (Kéler Bela); Invitation to the Dance (Weber); Selection from Mignon (Thomas); Gramophone Records: March (Lincke); Overture, Orpheus in the Underworld (Offenbach); Selection from Robert le diable (Meyerbeer); Gramophone Records: Overture, Si j'étais roi (Adam); Hungarian Rhapsody No. 1 in F (Liszt); Picador (Sousa). **5.30,** Literary Talk. **5.50,** Concert by a Young People's Choir. **6.20,** Talk. **6.50,** Concert by The Singing Sinners. **7.20,** Talk. **7.30,** News and S.O.S. Messages. **7.40,** Concert by the Station Orchestra, conducted by de Groot; Soloists: Lammen (Bass) and Bresser ('Cello): Overture, Figaro (Mozart); Bass Solo, Mentre di lascio o figlia (Mozart); Symphonic Variations for 'Cello (Boëllmann); Ballet Music from Undine (Lortzing); Aria from Zar und Zimmermann (Lortzing); Wo die Zitronen blühen (Strauss). **8.40,** Report and Talk on the International Swimming Contest at Amsterdam. **9.0,** Organ Recital. In an interval at **9.10,** Talk for Women. **9.20,** Report on the Swimming Contest (contd.). **9.40,** Orchestral Concert, conducted by van de Horst; Soloists: Gaby Ehrhardt (Songs) and de Boey (Songs). **10.40,** Report on the Swimming Contest (contd.). **10.50,** Gramophone Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.**—Programme of the Catholic Radio Society (K.R.O.). **11.40 a.m.,** Police Notes. **11.55,** Concert by the K.R.O. Sextet. In the interval at **12.40 p.m.,** Gramophone Music. **1.40,** Talk for Young People. **2.10,** Programme for Children. **3.40,** Interval. **3.55,** Gramophone Music. **4.10,** Writing Lesson. **4.40,** Gramophone Music. **4.55,** Sports Talk. **5.10,** Concert by the K.R.O. Orchestra, conducted by van 't Woud: Potpourri of German Marches (Blankenberg); Overture, An Printemps de la Vie (Monton); Potpourri, Contrasts (Robrecht); Love's Dream after the Ball (Czibulka); Orchestral suite (Pierné); De Rotterdamsche Vlag (Verhallen). **6.0,** Weekly Press Review. **6.25,** Concert (contd.): Donizetti Potpourri (Urbach). **6.40,** Police Notes. **6.55,** Talk. **7.15,** Gramophone Music. **7.25,** Talk. **7.40,** Concert by the K.R.O. Orchestra, conducted by van 't Woud: Farewell of the Gladiators (Blankenberg); Chinesische Nachtwache (Siede); In the Tea-house with a Hundred Steps (Yoshitomo); Waltz Potpourri (Robrecht); Die Schweitzer Schützengilde (Zimmer); March, Stars and Stripes (Sousa). **8.10,** Press Review. **8.15,** Gramophone Music. **8.40,** Songs. **9.0,** Concert by the K.R.O. Boys. In the intervals at **9.30,** Recitations, at **10.10,** News and Songs, and at **11.0** Gramophone Music. **11.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results and News. **8.10,** Film Review. **8.25,** Radio Concert. In an interval at **9.0,** News and Weather.

KALUNDBORG.—See **Copenhagen.**

KATOWICE

734 kc/s, 408 metres; 16 kW.—**6.10 p.m.,** Talk. **6.25,** See **Warsaw. 10.0,** Programme, relayed from **Lwow, 788 kc/s, 381 metres. 11.0,** See **Warsaw.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by **Helsinki, 815 kc/s, 368.1 metres.—3.0 p.m.,** Gramophone Music. **4.0,** Talk. **4.25,** Duets from Operettas. **5.15,** Concert by the Radio Orchestra, conducted by Erkki Linko. **5.40,** Talk. **6.5,** Accordion Solos by Vesterinen. **6.30,** Popular Programme. **7.15,** Dance Music by the Station Orchestra. **7.45,** News in Finnish. **8.0,** News in Swedish. **8.15,** Dance Music relayed from the Pörssi Restaurant. **10.0** (approx.). Close Down.

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.,** News and Weather. **12.35,** Concert by the Fröhliche Fünf, Willi Jansen (Accordion) and Hermann Kreisel (Saxophone). In the interval at **1.0,** Talk: The Watchword. **1.30 to 2.30,** See **Stuttgart. 2.30,** Market Prices. **2.45,** Talk in Dialect. **3.0 to 5.0,** See **Stuttgart.** In the interval at **4.0,** Talk: The Watchword. **5.0,** See **Frankfurt. 5.50,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0 to 9.20,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News and Sports Report. **9.45** till Close Down, See **Stuttgart. 1.0 a.m. (Sunday),** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

NOV. 11th SATURDAY *continued*

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—11.0 a.m.,** Concert. In the interval, Weather and Time. **12.15 p.m.,** News and Programme Announcements. **12.30,** Concert of Folk Music. **1.15,** Second News. **1.30,** Programme for Children. **2.10,** A Radio Sequence. **2.30,** The Watchword. **2.35,** Market Prices. **3.0,** Concert. **4.0,** Book Review. **4.15,** Economic Review. **4.25,** Gramophone Records of Bavarian and Swabian Music. **4.50,** Topical Talk. **5.0,** St. Martin's Day—Concert by the Leipzig University Madrigal Society. **5.40,** The Watchword. **5.45,** To-day's News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** Concert of Light Music. **9.0,** News and Sports Notes. **10.0,** Dance Music. **11.9** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.,** Gramophone Music and Traffic Report. **5.30,** Talk. **6.0,** Talk on Philosophy. **6.30,** Review of Foreign Affairs. **7.0,** Guitar Recital. **7.30,** Duets. **8.0,** Concert by the Station Orchestra. **9.0,** Weather and News. **9.15** (approx.), Gramophone Music.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—French Evening. **7.0 p.m.,** Quartet in G minor Op. 10 (Debussy), on Gramophone Records. **7.35,** The Scottish Symphony (Mendelssohn) on Gramophone Records. **8.10,** Talk in French: The Monuments of Alsace. **8.20,** Concert of French Music by the Station Orchestra, conducted by Pensis. Suite, Histoires (Ibert); L'Été (Chaminade-Mouton); Four Sketches (Gaubert). **8.50,** News in French. **9.0,** Musical Programme. **9.50,** News in German. **10.0,** Trio Concert. Selection from L'Enfant prodigue (Debussy); Serenade (Moszkovsky); Nina (Pergolesi); Elegy (De Taeye); Berceuse (Godard); Marche miniature viennoise (Kreisler). **10.35,** Georges Thill Music on Gramophone Records. **10.50,** Dance Music.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.,** Announcements. **6.25,** See **Warsaw. 6.40,** Programme Announcements. **6.45,** See **Warsaw. 10.0,** Programme to be Announced. **11.0,** See **Warsaw. 11.15** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—**7.30 p.m.** till Close Down. Programme relayed from **Paris (Eiffel Tower).** After the Relay, News Bulletin.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**6.0 to 8.0 p.m.,** Programme for Listeners in the Canary Islands, Guinea and Europe. **6.0,** Popular Concert. **7.15,** Talk. **7.30,** Light Music. **8.0 to 10.30,** Interval. **10.30,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12 Midnight** till Close Down, Programme in English by the I.B.C. Concert: Polonaise in A flat (Chopin); Sonata in G sharp (Mozart); Louis XIII (Couperin); Variation on Themes from The Magic Flute (Mozart); Allegretto (Bach); La Précieuse (Couperin). **12.30 a.m. (Sunday),** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Radio Journal, Talk and Dance Music. **8.15,** Topical Review. **8.30 to 9.30,** Interval. **9.30,** Chimes, Time and Topical Review. **9.45** (approx.), Variety Programme. In the interval, Readings. **11.45,** Topical Review. **12 Midnight,** Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**3.0 p.m.,** Folk Music by a Village Band. **3.50,** See **Prague. 5.5,** Review of the Week. **5.15,** See **Prague. 5.25,** Talk with Pianoforte Illustrations: Indian Tales and Songs. **6.0,** See **Prague. 6.25,** Report on the Inauguration of the Art Exhibition. **6.55,** See **Prague. 9.15,** See **Bratislava. 10.30** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.—10.45 a.m.,** Weather. **1.45 p.m.,** Weather. **2.0,** Concert. Sonata in C Minor (Grieg); Scherzo from the Quartet in D Minor (Schubert), on Gramophone Records; Two Songs (Schubert) by a Vocal Quartet. **3.0,** Wireless Notes. **4.30,** Concert. **5.30,** Concert with Vocal Solos. In the interval, Talk. **8.0,** News. **8.30,** Programme Announcements. **8.55,** Chimes. **9.5,** Press Review. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.,** Orchestral Concert, conducted by Erich Kloss. Overture, Die Felsenmühle (Reissiger); Abendlied (Schumann); Extract from Martha (Flotow); Waltz, Sonntagsginder (Siede); Potpourri Servus Wien (Dostal); Neapolitan Serenade (Becce); Geschichten aus dem Ennstal (Pachernegg); March, Im Aeroplan (v. Blon). **4.35,** The Volunteers—Radio Play for Young People (Alverdes), with Music by Liszt. **5.20,** The Watchword. **5.25,** Recital of Folk Songs by Robert and Lies Kothe (Songs to the Lute) and Marielnise Stamm (Violin). Maria ging über Land; Wesiche die Musik erkiest; Der Sunnwendmann; Was macht der Fuhrmann; Wenn wir verreisen. **5.45,** Wireless Notes. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** Concert of Wind Instrument Music. **8.0,** Concert by the Small Station Orchestra, conducted by Erich Kloss. **9.0,** Time and News. **10.0,** The Martinmas Goose. **11.0** (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredikkstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 477.1 metres; Porsgrund, 662 kc/s, 453.1 metres; and Rjukan, 671 kc/s, 447.1 metres;** and **Jeløy, LCL** (See Short-Wave List.—**3.15 p.m.,** Concert by the Station Orchestra, conducted by Kramm. Fanfare March (Fucik); Delibes Potpourri (Fétras); Japanese Lantern Dance (Yoshitomo); Caprice (Moszkovsky); Two Norwegian Dances (Raebel); Caro mio ben (Giordano); Oriental Fantasia (Wieniawsky); Souvenir de Christiania (Fauchey); Melancholy (Ole Bull); Selection from Gasparone (Millöcker); Minuet (Brögger); Indian Baechanale from Il Guarany (Gomez). **4.15,** Programme for Children, relayed from **Trondheim, 605 kc/s, 495.8 metres. 5.15,** Song and Hardanger Fiddle Recital of Norwegian Music. **6.0,** Talk on Economics. **6.15,** Weather and News. **6.30,** Radio Report from the Research Ship, Armauer Hansen. **7.0,** Time Signal. **7.1,** L'automne vert—Play in Four Acts (Gaston Sorbets). **8.50,** Weather, News and Topical Talk. **9.25,** Dance Music on Gramophone Records. **11.0** (approx.), Close Down

OSTERSUND.—See **Stockholm.**

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,** Le Journale Parlé. **7.30,** Concert arranged by the National Confederation for Ex-Servicemen and War-Disabled. The Orchestra, conducted by Flamant. Chant funèbre (Magnard); L'Horizon chimérique (Fauré); Sonata for 'Cello and Pianoforte (Boulnois); Familières (Pellerin); Les Saisons (Apollinaire); Recitation of Poems; Extracts from Requiem (Mozart). **9.0,** Memorial Programme in Honour of Georges Clemenceau, relayed from the Sorbonne. La Marseillaise; Overture, La Patrie (Bizet); Talk on Clemenceau; Les Préludes (Liszt); Items by Suzanne Devoyod; Suit in D (Bach); Pélléas et Mélisande (Fauré); Prelude to Messidor (Bruneau); Songs; Prélude à l'après-midi d'un faune (Debussy); Finale from Symphony No. 5 (Beethoven). **11.40** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music: Overture, Mirella (Gounod); The Ride of the Valkyries (Wagner). **7.15,** Le Journal Parlé. **7.30,** Gramophone Music: Aria from Hérodiade (Massenet); Two Airs from Les Brigands (Offenbach); Two Arias from The Grand Duchess of Gerolstein (Offenbach). **7.50,** Talk: The Event of the Week. **8.0,** Theatre Review. **8.30,** Sponsored Programme. **9.15,** Concert. **10.30,** News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture. **7.45,** Gramophone Music. **8.0,** Weather and Press Review. **9.0,** Mass in B minor (Bach) by Choirs, Orchestra and Soloists, relayed from the Old Conservatoire. **11.30,** Interval. **12 Noon,** Gramophone Concert. The Battle of Marignan (Jancquin); War Song (Handel); The Old Corporal (Dargominsky); Overture, Patrie (Bizet); Ode pour la Victoire de Fleurus (Catel); Death and Transfiguration (Richard Strauss); Three Arias from Judith (Honegger); The Eroica Symphony (Beethoven). In the interval at **1.0 p.m.,** Exchange, News and Weather, and at **1.30,** Exchange. **2.0,** Exchange. **2.15,** Programme for Children. **3.0 to 5.0,** See **Strasbourg. 6.20,** Gardening Talk. **6.45,** Gramophone Music. Overture, Masaniello (Auber); Adagietto from a Symphony (Mahler). **7.0,** Talk. **7.20,** Suite algérienne (Saint-Saëns) on Gramophone Records. **7.45,** Review by the Latin Press. **8.0,** Readings. **8.30,** News and Weather. **8.40,** Review by Dorin. **8.45,** Symphony Concert, conducted by Eugène

Bigot. Part I. Music by Composers killed in the War. Hymne à la Justice (Magnard); Two Vocal Poems (Caplet): (a) La Croix douloureuse, (b) Prière normande; La Toussaint (Boulnois); Pavane (Boulnois). Part II. Mass in D (Beethoven). In the interval at **9.15**, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.—7.0 p.m.**, Musical Originalities, from **New York.** **7.30**, Concert Echoes, from **New York.** **7.45**, Football Game. **9.30**, Concert Favourites, from **New York.** **10.0**, Casino Orchestra, from **New York.** **10.30**, A Recreo, Bill and Alex. **10.45**, Orphan Annie, from **New York.** **11.0**, News, Pat Haley. **11.15**, Sports, Programme Preview. **11.30**, Evensong. **11.45**, Al Williams, from **New York.** **12 Midnight**, Happy Felton's Orchestra. **12.30 to 3.0 a.m. (Sunday), New York** Relay. **12.30**, Circus Days. **12.45**, Annie, Judy, and Zeke. **1.0**, Waldorf Astoria Orchestra. **1.30**, Sous les Ponts de Paris. **2.0**, Jamboree. **3.0**, Behind the Law.

PORSGRUND.—See **Oslo.**

POZNAN

POLSKIE RADIO, 897 kc/s, 335 metres; 1.5 kW.—**6.5 p.m.**, Miscellaneous Items. **6.25**, See **Warsaw.** **6.40**, Programme Announcements. **6.45**, See **Warsaw.** **9.45**, Time and Sports Notes. **9.55**, See **Warsaw.** **11.15** (approx.), Close Down.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.**, See **Moravská-Ostrava.** **3.50**, Recitations for Children. **4.15**, Talk on Economics. **4.25**, Gramophone Records. **4.35**, Czech Lesson for Germans. **4.50**, Gramophone Music. **5.5**, Agricultural Report. **5.15**, Talk for Workers. **5.25**, News in German. **5.30**, German Transmission for Children. **6.0**, Time and News. **6.10**, Talk. **6.25**, Songs by the Holesovice Vocal Quintet. **6.55**, Talk: The Polish National Festival. **7.5**, Concert of Polish Music by the Philharmonic Orchestra, conducted by Jirak, relayed from the Smetana Hall. Soloists: Eugenia Uminska (Violin). **9.0**, Time and News. **9.15**, See **Bratislava.** **10.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS; 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.—6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28**, Time Signal from Neuchâtel Observatory. **11.30**, News and Weather. **11.40** (from **Lausanne**), Sports Notes, Tourist Report, Announcements, and Financial Notes. **12.10 p.m.** (from **Lausanne**), Gramophone Concert. **1.0 to 2.58**, Interval. **2.58**, Time Signal from Neuchâtel Observatory. **3.0** (from **Lausanne**), Concert by the Small Radio-Lausanne Orchestra, conducted by Moser. **3.45**, Concert, relayed from **Lugano.** **5.0** (from **Geneva**), Programme for Children. **5.20** (from **Geneva**), Programme for Young People. **5.40** (from **Geneva**), Film Notes. **5.55** (from **Geneva**), Talk. **6.30** (from **Geneva**), Announcements and Weather. **6.59** (from **Geneva**), Weather Report. **7.0** (from **Geneva**), Popular French Songs. **7.25** (from **Geneva**), Monologues. **7.40** (from **Geneva**), Concert by an Accordion Band, the Alf Edis Yodelling Club, and Marcel Rodin (Siffleur). **8.50**, News and Weather. **9.0** (from **Geneva**), Talk: The Work of the League of Nations. **9.30** (from **Geneva**), Dance Music on Gramophone Records. **10.30** (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**11.0 a.m.**, Weather. **1.15 p.m.**, Light Music. **5.0**, Weather. **8.5**, Programme for Children. **8.30**, Weather. **8.40**, Musical Programme and Announcements. **9.0**, Chimes and News. **9.30**, Reading. **10.0**, Concert by the Station Trio, with Choral Music on Gramophone Records. After the Concert, Dance Music. **1.0 a.m. (Sunday)**, Close Down.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**6.5 p.m.**, Festival Concert by the Station Orchestra, conducted by Medins, and the Daina Choir: Cantata for Choir and Orchestra (Medins); Solitude (Abele); Suite, Precious Stones (Vitols); Symphonic Sketch (Medins); The Tree of Knowledge, Legend for Choir and Orchestra (Vitols); Seven Latvian Songs (Vitols); Symphonic Poem, Imanta (Medins). In the interval at **7.0**, News. **8.0**, Weather and News. **8.15**, Concert of Chamber Music. **9.0**, Dance Music. **10.0** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres,** from **7.45 p.m.**, and **2RO, 25.4 metres.—11.30 a.m.**, Gramophone Music. **12 Noon to 1.15 p.m.**, Orchestral Concert. In the intervals at **12.30**, Giornale Radio, and at **1.0**, Time and Announcements. **3.30**, Children's Radio Review. **3.55**, Giornale Radio and Report of the Royal Geographical Society. **4.10**, Weather. **4.15 to 5.0**, Orchestral Concert: Motivi di danza (Barzizza); Czardas from Coppélia (Delibes); Melody (Gardel); A sera in terra di Toscana (Limenta); Overture. The Bartered Bride (Smetana); Anima catalana (Cortopassi); Gondoliera (Solazzi); Isabel of Castile (Bootz). **5.40 (Naples)**, Shipping and Sports Notes. **5.45**, Morse Signals and Dopolavoro Announcements. **6.0**, Tourist Report. **6.10**, Agricultural Notes and Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Giornale Radio. **7.0**, Time and Announcements. **7.15**, Mezzo-Soprano Song Recital by Franca Daidone. **7.30**, Giornale Radio and Sports Notes. **7.45**, Pianoforte Recital by Bianca Metalli: Sonata (Scarlatti); Bourrée for the left hand (Saint-Saëns); Etude brillante (Chopin). **8.0**, Italian Anthems: Marcia Reale (Gabeti); Giovinezza (Blanc). **8.15** (approx.), Relay of an Opera. In the intervals, Talk and Scientific Review. After the Programme, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at Intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.—7.0 to 8.0 p.m.** (approx.), Harvard v. Army Football Game, from **New York.** **12.45 a.m. (Sunday)**, Football Scores. **1.0**, Popular Programme. **1.30**, Antobal's Cubans, from **New York.** **1.45**, Utica Singers—Marion Williams and Roger Sweet. **2.0**, Baron Münchhausen (Comedian), from **New York.** **2.30**, Leo Reisman's Orchestra and Yacht Club Boys, from **New York.** **3.0**, Saturday Night Dancing Party, from **New York.** **4.0**, Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **9.20** (from **Berne**), Broadcast for Schools. **9.50 to 11.0**, Interval. **11.0** (from **Berne**), Gramophone Music. **11.29**, Time Signal from Neuchâtel Observatory, Weather and News. **11.40** (from **Berne**), Talk: The Week in the Federal Assembly. **11.50** (from **Berne**), Light Music on Gramophone Records. **12.15 p.m.** (from **Berne**), Song Recital. **12.25** (from **Berne**), Time, Weather and Exchange. **12.30** (from **Berne**), Request Gramophone Records. **12.45** (from **Berne**), Book Review. **1.15** (from **Berne**), Concert. **1.30** (from **Berne**), Monthly Review of Switzerland's Foreign Trade. **1.45** (from **Berne**), Do you know? . . . . **2.0 to 3.0**, Interval. **3.0** (from **Berne**), Harp Recital. **3.30** (from **Berne**), Readings from Newspapers of Thirty Years Ago. **3.45**, Concert relayed from Lugano. **5.0** (from **Basle**), Popular Music on Gramophone Records. **5.30** (from **Basle**), Programme for Children. **6.0**, Chimes from Zürich Churches. **6.15** (from **Basle**), Time, Weather and Market Prices. **6.20** (from **Basle**), Opera and Operetta Music on Gramophone Records. **7.0** (from **Basle**), Talk with Gramophone Illustrations: Baali. **7.30** (from **Basle**), Schubert and Franz Song Recital. **8.0**, Weather and News. **8.10** (from **Basle**), Popular Programme. **9.15** (from **Basle**), Dance Music on Gramophone Records. **10.0** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.—3.0 p.m.**, Light Orchestral Concert. Overture, Zampa (Hérold); Forbidden Fruit (Gastaldon); Selection from The Pearl Fishers (Bizet); Waltz (Davison-Schulters); Foxtrot (Jurmann-Kaper); Romance (Wideen); Selection from Viktoria and her Hussar (Abraham). **4.5**, Programme for Children. **4.30**, Gramophone Music. **5.30**, Old Dance Music. **6.15**, Weather and News. **6.30** (from **Göteborg**), Talk: The Swedish Language. **7.0**, Cabaret Programme. The Radio Orchestra, Inez Köhler (Songs), Olle Björling (Songs) and Witkowsky (Pianoforte). **8.30**, Dialogue. **8.45**, Weather and News. **9.0**, Dance Music from the Kristallsalon. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.0 a.m.**, Armistice Day Memorial Programme, relayed from the Fort de Vaux, Verdun. **11.45**, Concert by the Station Orchestra and Soloists; Conductor, Maurice de Villers. **12.45 p.m.**, News. **1.0**, Time. **1.1**, Orchestral Concert (contd.). **2.0**, Light Music on Gramophone Records. **2.30**, Interval. **3.0**, Requiem (Verdi), by the Choirs of St. William's Church and the Municipal Orchestra, relayed from St. William's Church; Conductor, Fritz Munch. **5.0**, Symphony Concert by the Pasdeloup Concert Society, relayed from the Théâtre des Champs Elysées, Paris. **7.0**, Talk: Armistice Day. **7.15**, Gramophone Music. **7.30**, Time and News. **7.45**, Gramophone Music. **8.0**, Press Review in German, Lottery Results, and Announcements. **8.30**, Le capriccio (Stravinsky), conducted by the Composer (on Gramophone Records). **8.55**, Press Review. **9.0**, See **Paris (Eiffel Tower).** **11.30** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.—11.0 a.m.**, Extracts from The Gipsy Baron—Operetta (Joh. Strauss) on Gramophone Records. **11.35**, Gramophone Music. **12.15 p.m.**, See **Frankfurt.** **12.25**, Local News and Weather. **12.35**, See **Langenberg.** **1.30**, Programme for Children. **2.15**, Morse Lesson. **2.30**, Bavarian Songs with accompaniment by a Zither Trio. **3.0**, Orchestral Concert, conducted by Otto Seyfert. Soloists: Oskar Besemfelder (Songs to the Lute) and Dütsch (Clarinet). Overture, Peter Schmoll (Weber); Romance from the Clarinet Concerto (Weber); Selection from Die Königskinder (Humperdinck); Die Flöte von Sanssouci (Graener); German Dances (Reger); Overture, Die beiden Schützen (Lortzing); Old South German Folk Songs; Variations on the Folk Song, 's kommt ein Vogel geflogen (Ochs); Old Folk Songs; Overture, The Merry Wives of Windsor (Nicolai). In the interval at **4.1**, To-day's Watchword. **4.40**, Talk: The Day of the Red Terror in Munich. **5.0**, See **Frankfurt.** **5.50**, Time, Agricultural Report and Weather. **6.0**, Transmission for all German Stations, relayed from **Berlin (Funkstunde).** **7.0 to 9.20**, See **Frankfurt.** **9.20**, Topical Talk. **9.30**, Local News, Weather and Sports Report. **9.45**, Gramophone Music. **10.0**, Variety Concert. The Station Orchestra, conducted by Gustav Görlich. **11.0**, Serenade. **1.0 a.m. (Sunday)**, Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.**, News. **6.15**, Opera Music: Selection from Lakmé (Delibes); Thérèse (Massenet); Marouf (Rabaud) and Mirella (Gounod). **6.30**, Orchestral Music: Selection from The Golden Cockerel (Rimsky-Korsakov); Schubert Potpourri (arr. Berté); Bourrée fantasque (Chabrier). **6.45**, Sound Film Music. **7.0**, Hawaiian Guitar Music. **7.15**, News and Racing Results. **7.30**, Bugle Calls of the Cavalry and Infantry. **7.45**, Popular Melodies. **8.0**, Music by a Viennese Orchestra. **8.15**, Opera Music: Selection from The Bartered Bride (Smetana); Hérodiade (Massenet); Sigurd (Reyer); and Tannhäuser (Wagner). **8.30**, Concert for St. Hubert's Day—Trumpet and Hunting Horn Music. **8.45**, Popular Melodies. **9.0**, Extracts from Le Jongleur de Notre Dame (Massenet), followed by Military Music, Chansonnettes, and Popular Melodies. **10.0**, Operetta Music: Selection from Miss Decima (Audran); Les mousquetaires au couvent (Varney); and Elle est à vous (Yvain). **10.15**, North-African News and Local News. **10.30**, Concert for Listeners in Morocco; Part I: Opera Music: Selection from Carmen (Bizet); Romeo and Juliet (Gounod); and Don Quixote (Massenet); Part II: Orchestral Music: Waltz (Chopin); Melody (Rodde); Boite à musique d'or (Krome); Two Melodies (Rodde). **11.0**, Accordion Music. **11.15**, Music by an Argentine Orchestra. **11.30**, Concert by a Viennese Orchestra. **12 Midnight**, News, Weather, and Announcements. **12.5 a.m. (Sunday)**, Spanish Songs. **12.15**, Orchestral Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—4.10 p.m.**, Chamber Music on Gramophone Records: Toccata and Clair de lune (Debussy); Minuet from the Quartet No. 13 (Mozart); Sarabande and Allegretto (Corelli-Kreisler); La leggerezza (Liszt); Song of the Flea (Mussorgsky); Scherzo and Tarantella (Wieniawsky). **5.0 to 5.5**, Weather. **5.40**, Giornale Radio, Lottery Results, Dopolavoro Notes, and Gramophone Music. **6.10**, Market Prices. **6.20**, News in Foreign Languages. **6.40**, Gramophone Music. **7.0**, News, Giornale Radio, and Weather. **7.25**, Talk: Events and Problems. **7.30**, Gramophone Music. **8.0** till Close Down, See **Rome.**

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres** (Evening); 10 kW.—**10.0 to 10.15 a.m.**, Religious Announcements in Various Languages. **7.0 to 7.15 p.m.**, Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m.**, Concert by the Wiener Symphoniker, conducted by Josef Holzer: Waltz, Am Elbestade (Ertl); Mariengavotte (Donath); Cote d'Azur (Felber); March, Die Maus (Lincke); Liebes-Serenade (Gangiberger); Serenade (Gluck); Potpourri, Für lustig Leut' (Komzak). **12 Noon**, Time and News. **12.10 p.m.**, Gramophone Concert of Variety Music. **1.0**, Interval. **2.0**, Time and Announcements. **2.15**, Italian Lesson. **2.45**, Choral Concert for the Seventieth Anniversary of the Vienna Schubert Society, conducted by Viktor Keldorfer: Three Songs (Schubert): (a) Im gegenwärtigen Vargangenes, (b) Die Nacht, (c) Das Dörfchen. Three Songs (Mair): (a) Suomis Sang, (b) Rausche, froher Bach, (c) Wie die wilde Rose im Wald; Der Tanz (Schubert-Keldorfer). Baritone Solo: Mein Wien, gesegnet bist du (Fischer); Weana Maden (Ziehrer-Kirchl). **3.30**, Wireless Talk. **4.0**, Gramophone Music. Part I, Das Hexenlied (von Schillings Wildenbruch), by the Berlin Philharmonic Orchestra, conducted by the Composer. Part II, Light Music and Dance Music by the Oscar Joost Orchestra. **5.30**, Topical Talk. **5.50**, Time and Announcements. **6.0**, Programme for the Four Hundred and Fiftieth Anniversary of the Birth of Martin Luther, relayed from the Gumpendorf Lutheran Church. The United Vienna Lutheran Church Choirs, conducted by Hans Winslöw, and Franz Kemmel (Organ): Organ Prelude in G (Bach); Luther Hymns for Mixed Choir, Organ, and Wind Instruments (Nadler). Address. Ein'feste Burg ist unser Gott. **7.5**, Talk for Jonas Lie's Centenary. **7.35**, To-day's Motto. **7.40**, Concert of Austrian Opera Music by the Volksoper Orchestra, conducted by Karl Anderieth. Soloists: Rosette Anday (Contralto) and Karl Hammes (Baritone). Overture, Iphigenie in Aulis (Gluck); Contralto Solo from Orpheus and Eurydice (Gluck); Baritone Recitative and Aria from Figaro (Mozart); Turkish March from The Seraglio (Mozart); Baritone Solo from The Magic Flute (Mozart); Leonora Overture No. 3 (Beethoven); Baritone Aria from The Queen of Sheba (Goldmark); Contralto Solo from Der Evangelimann (Kienzl); Prelude and Entr'acte from Der Corregidor (H. Wolf); Contralto Solo, Prayer from Höllisch Gold (Bittner); Baritone Solo from Die tote Stadt (Korngold); Entr'acte and Carnival Music from Notre-Dame (Schmidt). **9.10**, News. **9.25**, Concert by the Karl Haupt Orchestra and Soloists, relayed from the Lehár Saal of the Hotel Krantz Ambassador. After the Concert, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.**, Chimes and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5**, Soldiers' Songs (on Gramophone Records). **11.30**, Radio Journal. **11.35**, Weather. **11.38**, Gramophone Records (contd.). **12.0 Noon**, Interval. **2.30**, Economic Notes. **2.40**, Military Music (on Gramophone Records). **2.55**, Aviation Report and Anti-Gas Drill. **3.0**, Programme for Invalids, relayed from **Lwów, 788 kc/s, 381 metres.** **3.40**, French Lesson. **3.55**, Concert by a Soldiers' Choir with Introductory Talk. **4.50**, Agricultural Notes. **5.0**, Talk. **5.20**, Pianoforte Recital of Polish Music by Mme. Mirska: Christmas Carol; Prelude and Fugue, Op. 5, No. 5 (Brzezinsky); Sarabande, Op. 14, No. 5 (Paderevsky); Capriccio, Op. 14, No. 8 (Paderevsky); The Enchanted Lake (Niewiadomsky); Dance and Mazurka (Stojowsky); Air, Op. 28 (Rozycki); Play of the Waves (Rozycki); Two Mazurkas (Szymanowsky); The Spinner (Moniuszko-Melcer). **6.5**, Miscellaneous Items. **6.25**, November Poetry—Reading. **6.40**, Programme Announcements. **6.45**, Radio Journal. **7.0**, Answers to Technical Correspondence. **7.15**, Programme for the Fifteenth Anniversary of the Independence of Poland. Concert of Polish Music, 1918 to 1933, by the Station Symphony Orchestra, conducted by Wolfstal. Soloist: Irene Dubisla (Violin); Address; National Anthem; Selection from the Ballet, Pan Twardowski (Rozycki); Violin Concerto, No. 2 (Mlinarsky); Pianoforte Concerto in F Minor (Chopin); Symphonic Poem, Nevermore (Morawski); Suite, Kurpir (Kondracki); Finale from Symphony No. 4 (Maliszewski). **9.45**, Sports Notes. **9.55**, Aviation Weather Report and Police Notes. **10.0**, Humorous Programme, relayed from **Lwów.** **11.0**, Transmission for all Polish Stations and the United States of America. Programme from the Royal Castle. Address by the President of the Republic, followed by Chopin Pianoforte Recital by Josef Turczynski.

WILNO

530 kc/s, 566 metres; 16 kW.—**6.5 p.m.**, Weekly Lithuanian Review. **6.20**, Miscellaneous Items. **6.25**, Programme for Students. **6.40**, Programme Announcements. **6.45**, See **Warsaw.** **10.0**, Programme relayed from **Lwów.** **11.0** till Close Down, See **Warsaw.**

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—**6.30 p.m.**, Announcements and News. **7.0**, Programme in Honour of the Thirteenth Anniversary of the Treaty of Rapallo, relayed from **Ljubljana.** **8.30**, Dance Music. **9.0**, News, Weather and Programme Announcements. **9.15**, Dance Music. **10.0** (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender.**

NOV. 11th SATURDAY *continued*

PRINCIPAL BROADCASTING STATIONS OF EUROPE

Arranged in Order of Wavelength

Metres.	kc/s.	kW.	Station.	Tuning Positions.
935	155	7	Kaunas (Kovno) (Lithuania)	
875	160	8.5	Huizen (Holland) (*Kootwyk*, 50kW., *after 3.40 p.m.*) (*K.R.O. and N.C.R.V. programmes.*)	
796	167	40	Lahti (Finland)	
725	174	75	Radio Paris, CFR	
635	183.5	60	Berlin (Deutschlandsender) (Germany). (*S.-W. Stn. DJA on 31.38 m., DJB on 19.73 m., DJC on 49.83 m., DJD on 25.51 m., DJE on 16.86 m.*)	
554.4	193	30	Daventry National	
538	195	7	Ankara (Angora) (Turkey)	
481	202.5	500	Moscow, RV1 (Old Komintern) (Russia)	
446	207.5	13	Eiffel Tower, FL, Paris	
412	212.5	120	Warsaw I (Poland)	
380	217.5	100	Novosibirsk, RV76 I (Russia)	
348	222.5	30	Motala (Sweden). (*Relays Stockholm*)	
304	230	100	Moscow, WZSPS (Trade Union) (Russia)	
200	250	5	Stamboul (Turkey)	
200	250	21	Reykjavik (Iceland)	
190	252	200	Luxembourg	
170	256	25	Tashkent, RV11 (Russia)	
154	260	60	Kalundborg (Denmark). (*Relays Copenhagen*)	
154	260	20	Monte Ceneri (Switzerland).	
117	268.5	40	Moscow, Popoff RV58 (Russia)	
083	277	60	Oslo (Norway)	
071	280	35	Tiflis, RV7 (Russia)	
035	290	36	Kiev, RV9 (Russia)	
000	300	100	Moscow RV39 (Russia). (*S.-W. Stn. on 50 m.*)	
938	320	20	Kharhov, RV4 (Russia)	
857	350	100	Leningrad (Russia)	
840	357	18.5	Budapest (Hungary)	
825	363.6	50	Sverdlovsk, RV5 (Russia)	
760	395	1.3	Geneva (Switzerland). (*Relays Sottens*)	
720	416.6	20	Moscow, RV2 (Experimental) (Russia)	
690	434.6	1.5	Oulu (Uleaborg) (Finland)	
574.7	522	0.7	Hamar (Norway) (*Relays Oslo*)	
574.7	522	7	Ljubljana (Yugoslavia)	
570	527	0.25	Freiburg (*Relays Muhlacker*)	
568.1	528	2	Grenoble (France)	
560	536	1.5	Kaiserslauten and Augsburg (*Relay Munich*)	
550	545	18.5	Budapest No. 1 Lakihegy (Hungary)	
542	554	10	Sundsvall (Sweden). (*Relays Stockholm*)	
537.6	558	3	Palermo (Italy)	
533	563	60	Munich (Germany)	
525	571	15	Riga (Latvia)	
517.2	580	100	Vienna (Bisamberg) (Austria)	
509	589	15	Brussels No. 1, Velthem (Belgium). (*In French*)	
500.8	599	20	Florence, 1FI (Italy) (*Relays Turin*)	
495.8	605	1.2	Tröndelag (Norway)	
493.4	608	16	Wilno (Poland). (*Relay Station*)	
488.6	614	120	Prague (Czechoslovakia)	
480	625	50	North Regional (Manchester)	
472.4	635	60	Langenberg (Germany)	
465.8	644	1.5	Lyons la Doua, PTT (France)	
459.4	653	60	Beromünster (Schweizerischer Landessender) (Switzerland).	
453.2	662		San Sebastian, EAJ8 (0.6 kW.); Pori (1.0 kW.) (Finland); Klagenfurt (0.5 kW.) (Austria) (*relays Vienna*).	
453.2	662	0.25	Agen (France)	
453.2	662	4	Milan (Vigentino) (Italy). (*Relays Rome*)	
451.8	664	20	Madona (Latvia). (*Relays Riga*)	
447.1	671	0.5	Danzig (*Relays Heilsberg*)	
447.1	671	7	Paris, Ecole Supérieure, PTT	
441.2	680	50	Rome, IRO. (*S.-W. Station, 2RO on 25.4 m.*)	
435.4	689	55	Stockholm, SASA (Sweden)	
430.4	697	2.5	Belgrade (Yugoslavia)	
424.3	707	2	Madrid, EAJ7 (Union Radio)	
424.3	707	100	Moscow, Imini Stalina (Russia)	
419.5	715	1.5	Berlin, Funkstunde (Germany)	
416.4	720.5	5	Rabat (Morocco)	
413	725	60	Athlone (Irish Free State)	
408.7	734	16	Katowitz (Poland)	
403.8	743	25	Sottens (Radio Suisse Romande) (*Switzerland*)	
398.9	752	25	Midland Regional (Daventry)	
394.2	761	12	Bucharest (Roumania)	
389.6	770	120	Leipzig (Germany)	
385.1	779	8	Toulouse (Radiophonie du Midi) (France)	
385.1	779	10	Stalino, RV26 (Russia)	
381	788	16	Lwow (Lemburg) (Poland)	
376.4	797	50	Scottish Regional (Falkirk)	
372.2	806	1.5	Hamburg (Germany)	
370.1	810.5	0.8	Radio, LL, Paris	
368.1	815		Seville, EAJ5 (Union Radio) (1.0 kW.); Galicia EAJ4 (0.2 kW.) (Spain); Bolzano (1.0 kW.) (Italy); Helsinki (10 kW.) (Finland) (*relays Lahti*); Kharkov, RV20 (10kW) (Russia).	
368.1	815	0.7	Fredriksstad (Norway). (*Relays Oslo*)	
364.1	824	1	Bergen (Norway)	
363.6	825	13	Algiers (Algeria)	
360.6	832	60	Mühlacker (Stuttgart) (Germany)	
355.9	843	50	London Regional (Brookmans Park)	
352.1	852	7	Graz (Austria). (*Relays Vienna*)	
348.8	860	7.6	Barcelona, EAJ1 (Spain)	
348.8	860	10	Leningrad, RV70 (Russia)	
345.2	869	11.5	Strasbourg, PTT (France)	
341.7	878	35	Brno (Brunn) (Czechoslovakia)	
338.2	887	15	Brussels II Velthem (Belgium). (*In Flemish*)	
335	896	5	Cadiz (Spain)	
334.4	897	1.9	Poznan (Poland)	
331.5	905	50	Milan (Italy). (*Relays Turin*)	
328.2	914	60	Poste Parisien (France)	
325	923	60	Breslau (Germany)	
321.9	932	10	Göteborg (Sweden). (*Relays Stockholm*)	
318.8	941	0.25	Dresden (Germany). (*Relays Leipzig*)	
318.8	941	1.5	Naples, INA (Italy). (*Relays Rome*)	
315.8	950	1.6	Marseilles, PTT (France)	
312.8	959	1.7	Cracow (Poland)	
312.8	959	10	Genoa, IGE (Italy). (*Relays Turin*)	
309.9	968	50	West Regional (Washford Cross)	
307	977	0.7	Radio Vitus (Paris). (*S.-W. Stn. on 43.75 m.*)	
307	977	0.75	Zagreb (Yugoslavia)	
304	986	13	Bordeaux Lafayette, PTT (France)	
301.5	995	50	North National (Manchester)	
298.8	1004	11	Tallinn (Estonia)	
296.1	1013	20	Hilversum (Holland). (*7 kW. before 4.40 p.m.*) (*V.A.R.A., A.V.R.O. and V.P.R.O. programmes.*)	
293.5	1022	0.7	Limoges, PTT (France)	
293.5	1022	2.6	Kosice (Czechoslovakia)	
291	1031	13.2	Viipuri (Viborg) (Finland). (*Relays Helsinki*)	
288.3	1040	50	Scottish National (Falkirk)	
288.3	1040	1	Bournemouth. (*Relay Station*)	
286	1049	0.8	Montpellier (France)	
284.8	1053	0.7	Lyons (Radio-Lyon) (France)	
283.6	1058	0.5	German Relays (Berlin, Magdeburg, Stettin)	
283.6	1058	0.5	Innsbruck (Austria). (*Relays Vienna*)	
282.2	1063	2	Lisbon CT 1AA (Portugal). (*Short-wave Station on 31.25 m.*)	
281.2	1067	0.75	Copenhagen (Denmark)	
278.8	1076	13.5	Bratislava (Czechoslovakia)	
276.5	1085	60	Heilsberg (Germany)	
273.7	1096	7	Turin (Italy)	
271.5	1105	1.3	Rennes, PTT (France)	
269.8	1112	20	Bari (Italy) (*Relays Rome*)	
267.6	1121	0.75	Valencia (Spain)	
267.4	1122	6.25	Nvireghaza (Hungary). (*Relays Budapest*)	
265.8	1128.5	1.3	Lille, PTT (France)	
263.8	1137	11.2	Moravska Ostrava (Czechoslovakia)	
261.5	1147	50	London National and West National	
259.3	1157	17	Frankfurt-a.-M. (Germany)	
259.3	1157	2.3	Trier and Cassel. (*Relay Frankfurt*)	
257.1	1167	10	Hörby (Sweden). (*Relays Stockholm*)	
255.1	1176	0.7	Toulouse, PTT (France)	
253.1	1185	5	Gleiwitz (Germany). (*Relays Breslau*)	
252	1193	1	Barcelona, EAJ15 (Assoc. Nat.) (Spain)	
249.6	1202	0.8	Juan-les-Pins, Nice (France)	
247.7	1211	10	Trieste (Italy). (*Relays Turin*)	
245.9	1220		Berne (0.5kW.) (Switzerland) (*relays Beromünster*); Eskilstuna (0.2kW.), Säffle (0.4 kW.) (Sweden) (*relays Stockholm*); Linz (0.5 kW.) (Austria) (*relays Vienna*); Turku (Abo) (0.5 kW.) (Finland) (*relays Helsinki*).	
244.1	1229	0.5	Basle (Switzerland). (*Relays Beromunster*)	
242.3	1238	1	Belfast (N. Ireland)	
240.6	1247	0.5	Stavanger (Norway)	
238.9	1256	2	Nürnberg (Germany). (*Relays Munich*)	
238	1260	1	Nimes (France)	
237.2	1265	3	Bordeaux, Sud-Ouest (France)	
235.5	1274	0.5	Kristiansand (Norway)	
233.8	1283	1.65	Lodz (Poland). (*Relay Station*)	
232.2	1292	0.25	Kiel (Germany). (*Relays Hamburg*)	
230.6	1301	—	Swedish Relay Stations	
227.4	1319		Flensburg, Bremen and Hanover. (*Relay Hamburg*)	
225.9	1328	10	Fécamp, Radio-Normandie (France)	
224.4	1337	1	Cork (Irish Free State)	
219.9	1365	1.5	Béziers (France)	
218.5	1373	0.2	Plymouth	
218.5	1373	0.5	Salzburg (Austria). (*Relays Vienna*)	
217	1382	0.5	Königsberg (East Prussia). (*Relays Heilsberg*)	
214.3	1400	1	Aberdeen	
211.3	1420	1	Newcastle	
209.8	1430	1.25	Magyarovar, Miskole and Pecs (Hungary)	

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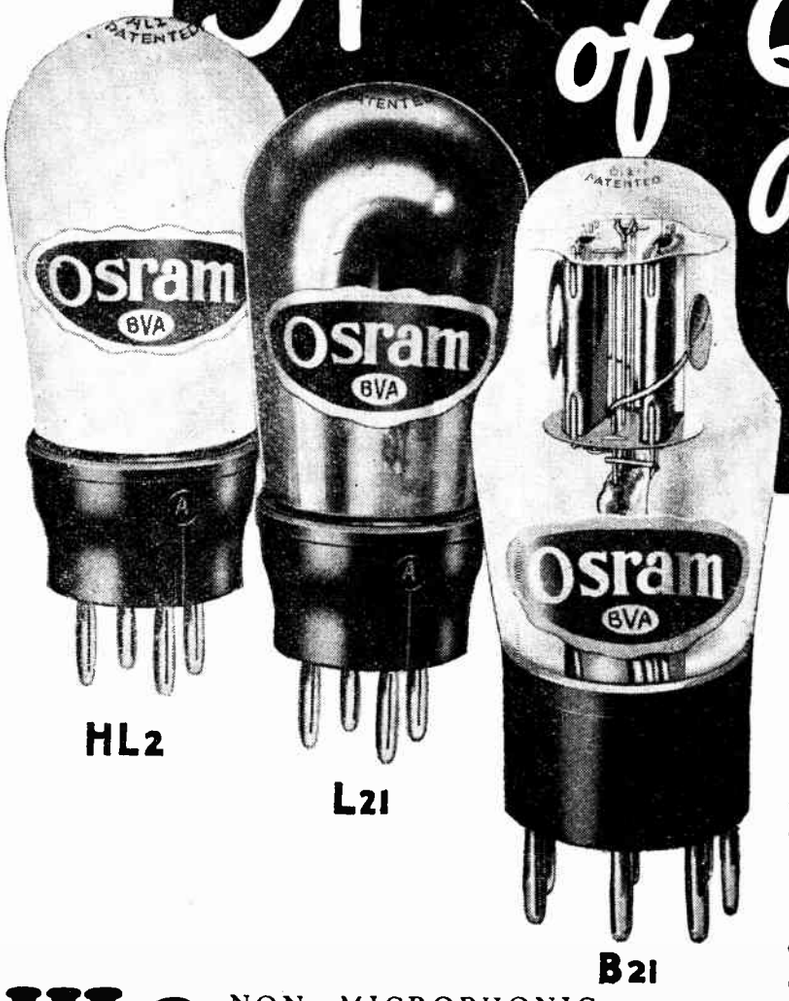

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HL2 NON-MICROPHONIC DETECTOR. Filament current 0.1 amp. Amplification Factor 27. Impedance 18000 ohms. Mutual conductance 1.5 m.a./volt.

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L21 ECONOMY DRIVER. Filament current 0.1 amp. For 120 v. H.T.: Standing anode current 1.7 m.a. approx. Working grid bias 4½ volts. Mutual conductance 1.8 m.a./volt.

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Broadcast Brevities

By Our Special Correspondent

"They Won't Pay Up"

IT is strange—or is it?—that the abolition of the Zone system in Empire broadcasting has been regarded in some quarters as the handwriting upon the wall, fate knocking at the door, etc. It has been more than whispered that the B.B.C. is losing interest in the whole affair, not being able to see any likely return for its money.

"Empire and Colonies are not responding," the Jeremiahs have been saying. "They won't pay up."

The Facts

To be perfectly frank, I believe that the B.B.C. has long since abandoned any hope of a direct financial return for the Empire service. Yet, although the Corporation is spending at least £45,000 per annum on Empire broadcasting, it is not one whit worse off than it would be if it were to close down the Daventry short-wave station to-morrow.

And Why?

If the £45,000 were not spent on the Empire transmissions, the money would be appropriated by the Treasury.

So, in any case, your money and mine would be used up in one way or the other. In the circumstances, I vote for Empire broadcasting.

A Big Job

Cecil Graves, originally the Director of Empire Broadcasting, now combines this job with that of Foreign Director, and concerns himself not only with making the Empire "Britain-conscious," but in arranging broadcast relays with foreign countries and building up understanding between the B.B.C. and similar organisations abroad.

Actually, though people have not yet realised it, Capt. Graves' job is going to be one of the most important at "B.H."

Grown-up Children

PROBABLY 75 per cent. of listeners to the Children's Hour are adults. I may be challenged on this point, but I sit composedly on a bundle of statistics which also go to show that children form 75 per cent. of listeners to the alternative dance music.

All this is by the way.

Official

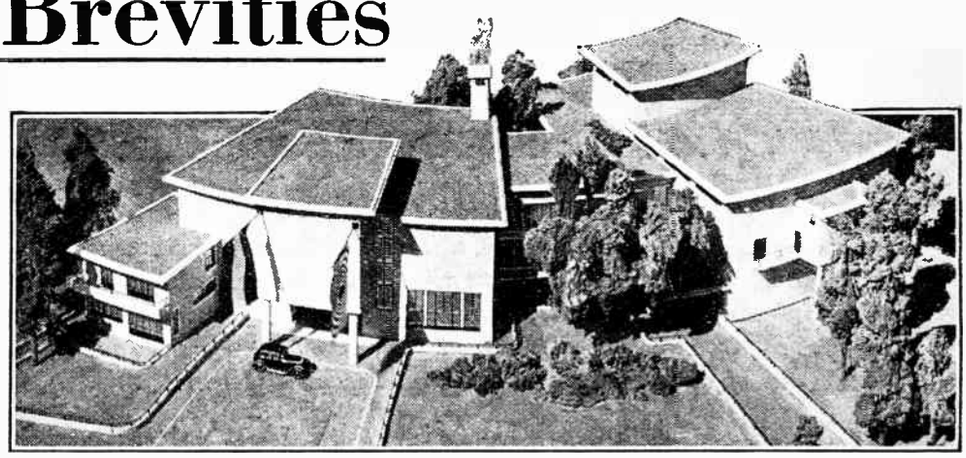
The piece of official news that I really wish to communicate is that we are to be spared Children's Hours run by the children themselves. This is splendid.

Children are notoriously bad at entertaining each other, not to mention their adult companions.

This "Wireless"

IN the rooms of the chiefs at Broadcasting House the walls are now decorated with a new map showing the disposition of land lines all over the country.

I took the trouble last week to count up the number of miles covered by this vast network. It appears that the B.B.C. is now using some 4,500 miles of wire to connect about twenty stations and control points. Between certain stations there are as many as ten cables. And they call it "wireless."



DESIGN IN MODERN BROADCASTING.—A clever model of the new "Broadcasting House" now under construction at Hilversum for A.V.R.O., the Dutch independent broadcasting association. The building will incorporate a studio to suit every type of programme.

"La Vie Parisienne"

A TWO-PART broadcast takes place on November 13th and 14th, when "La Vie Parisienne" will be heard—Part One on the National, and Part Two on the Regional wavelength. In the plot of the stage version by A. P. Herbert and A. Davies Adams a great deal of the comedy depended, as might be expected, upon visual effects. The plot has been a good deal simplified for broadcasting. The characterisation remains the same, and, of course, A. P. Herbert's lyrics and the music of A. Davies Adams remain.

A "Stay-at-Home" Night

The original French lyrics have been translated into English, and it has been necessary to make a few alterations in order to clarify the plot for the benefit of listeners. I am told that there will be a maximum of music and a minimum of dialogue and effects, so the evening promises to be an enjoyable one.

Lady Announcers for the Provinces

ALTHOUGH the voice of Mrs. Borrett may no longer be heard in announcements on the air after Sunday next, I can state that women announcers will occasionally be employed at provincial stations.

Bravo, Mrs. Borrett!

Incidentally, everyone must admire the courageous manner in which Mrs. Borrett has carried out her duties since the announcement of her impending departure. It is unusual in most walks of life to expect anyone to continue to work in the blaze of publicity after an unfavourable decision has been made known to the world at large, and I, for one, am surprised that the B.B.C. should have followed their present course.

But Mrs. Borrett is keeping the flag flying to the end.

Pepping Up the Politicians

ALTHOUGH the average politician at the microphone lacks the sparkle of Tommy Handley or Gillie Potter, there may be an improvement very soon. The denizens of Westminster are seriously studying microphone technique, as witness the latest experiment of the Conservative Party, which is providing a special course on "Broadcasting and Public Opinion" at Ashridge during the week-end covering December 10th.

How to Talk to "Mike"

Lord Bridgeman, one of the B.B.C. Governors, will open the course and Capt. Ian Fraser, M.P., will deliver a special address on "Talking to the Microphone." Other speakers will be Lord Allen of Hurtwood, on "The Significance of Broadcasting"; Professor Ernest Barker, on "The Constitution of the B.B.C.," and Sir Charles Petrie, on "Broadcasting and International Affairs." Who knows but what "Political Nights" may not be the rage next year?

A Bawler-Back?

These political nights would provide good scope for testing an idea submitted to one of the daily papers last week.

"Perhaps," wrote a correspondent, "the B.B.C. might think out some method of answering back for listeners who do not like the opinions they hear. Why not a *representative broadcasting listener* to bawl back at the B.B.C. bawlers?"

I suggest "Free Grid."

Eric Gill Statue Comes to Life

SPECIALLY adapted for broadcasting, Shakespeare's "Tempest" will be heard by National listeners on November 12th in a Prologue and seven scenes. Val Gielgud and E. A. Harding are responsible for the adaptation, and music has been composed by Kate Coates and Leslie Woodgate.

Prospero is to be that well-known actor, John Gielgud, while the part of Ariel will be played by Leslie French, who, it may be recalled, provided the model upon which Eric Gill, the famous sculptor, based his interpretation of an Ariel in human form for the group which adorns the main entrance to Broadcasting House.

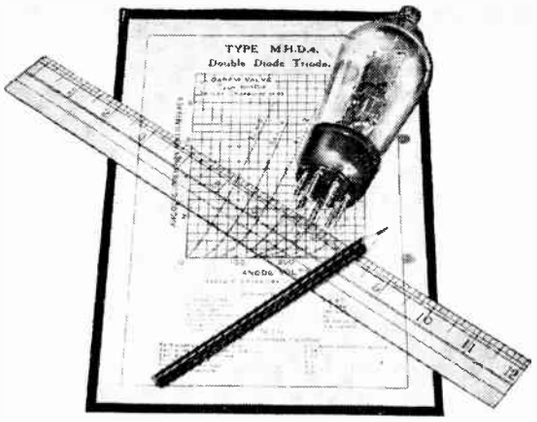
Henry Hall's Boys at Play

FRANKIE WILSON, one of the trumpeters in Henry Hall's band, captained the "boys" in a football match on the B.B.C. ground at Motspur Park on October 26th. The opposing team was composed of Scotsmen drawn from various dance bands in the London district.

I should say that the B.B.C. boys had the advantage, for the referee was Burton Gillis, the leader of the band, who stands 6ft. 7in. high in his socks and weighs seventeen stone. There is a prejudice in favour of not quarrelling with referees of this build.

However, they lost by 2 goals to 1.

How to Use Valve Load Diagrams



TO get a proper understanding of what a valve is doing and to know when it is being used efficiently, it is essential to understand how to read valve load diagrams. Unfortunately, on the incorrect assumption that it is a complicated business, many people shirk trying to understand them. The purpose of this article is to explain both the preparation and use of these diagrams in the simplest possible manner.

Vital Information by Graphical Methods

By M. G. SCROGGIE, B.Sc., A.M.I.E.E.

VALVE curves, like guardsmen's uniforms, are divisible into two classes—the ones to be looked at and the ones to be used. Those printed on the slips accompanying the valves and in the less detailed catalogues are usually of the former class, and are fairly easy to understand, though it is of relatively little importance whether they are understood or not, for they give only

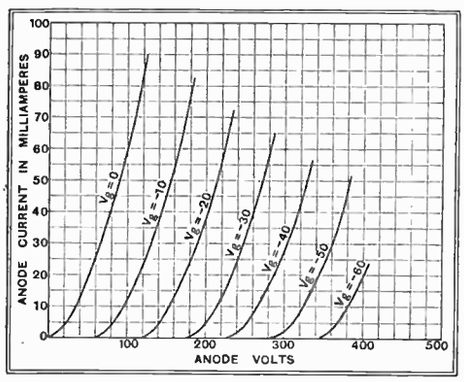


Fig. 1.—Typical set of anode volts/anode current curves for a triode valve.

very general information—not even enough to distinguish a pentode from a triode. They are of the type which show scales of anode current and grid voltage, with a separate curve for each anode voltage.

The other sort look very much the same except that anode and grid voltage have changed places. They can be used to disclose a great deal of useful information about the valve to which they refer, but as it is necessary to add a number of mysterious curves and straight lines, many readers no doubt prefer to do without the information rather than wrestle with the intricacies of the diagram.

This is a pity, because it is really quite easy to master the valve load diagram, as it is called, and thereafter form a very clear mental picture of what a valve is doing, and whether it is doing it properly. In particular, one is able to compare for oneself the merits of different types of valves, with three, four, five or more electrodes, that are offered for any particular job.

The apparent difficulty probably consists of the representation of current, voltage, resistance and power all at once on a single diagram. This would indeed be confusing if these were all separate and independent quantities, for it would involve four dimensions; a condition popularly associated with the occult. But there are really only two dimensions—current and voltage—and they can be represented as height and breadth on a piece of paper. The other two quantities are combinations of the first two. Power is current multiplied by voltage, and as height multiplied by breadth is area, power appears as area on the diagram. That seems quite sensible. Then resistance, according to friend Ohm, is voltage divided by current. That may appear less easy to show on the diagram, unless one remembers that a *gradient* of, say, one in four, is represented by the fraction $\frac{1}{4}$. So it is reasonable to suppose that one divided by four can be represented as a gradient. A resistance of 1,000 ohms, or one volt divided by one milliamp., is represented by a line sloping one milliamp division up for every volt division along.

Anode Volts—Anode Current

Now, looking at Fig. 1, which is a typical set of curves for a triode power valve, the anode voltage and anode current scales are shown extending horizontally and vertically. The lines sloping upwards to the right represent the behaviour of the valve. The one marked Vg = O was obtained by making the grid bias equal to O and gradually increasing the anode voltage, noting the corresponding current. The height of any point on the curve was made to mark the current at the voltage represented by the distance to the right. The same was then repeated with a grid bias of 10 volts, giving a very similar line shifted to the right, and so on for other bias voltages. There could be, of course, an infinite number of such lines, but one can imagine the intermediate ones fairly easily.

According to what has just been explained, if another valve's lines sloped more steeply it would show that that valve had a lower anode resistance. The other resistance that enters into the combination in order to obtain a useful result is the resistance of the load, which may be a loud speaker. This resistance is distinguished by sloping up to the *left*, but at the moment we don't know where to put it. First of all certain areas must be declared out of bounds, as in Fig. 2.

All the space to the left of the Vg = O line corresponds to positive grid voltage which with ordinary valves results in grid current and distortion; so that area is forbidden. Then the valve curves must be reasonably straight and evenly distributed or another form of distortion is caused this requirement cuts out the strip close to the voltage scale. Just how much is cut out will be seen later. The third boundary is laid down by the maximum amount of power that the valve can dissipate without overheating, and is usually approached only in an output stage. Thus in the particular valve illustrated the limit is 12 watts. A power of 12 watts is represented by a rectangular area having two of its sides formed by the volt and milliamp scales, and the other two chosen to enclose the right amount of space. For instance, 250 volts and 48 milliamps multiply up to give 12,000 milliwatts, or 12 watts, so that is one area that fulfils the conditions. But it is better not to trouble marking off its four sides, because there are endless numbers of other areas that also represent 12 watts, and it is enough simply to put a dot at the top right-hand corner. If the same is done for a number of other pairs of numbers such as 120 and 100, and

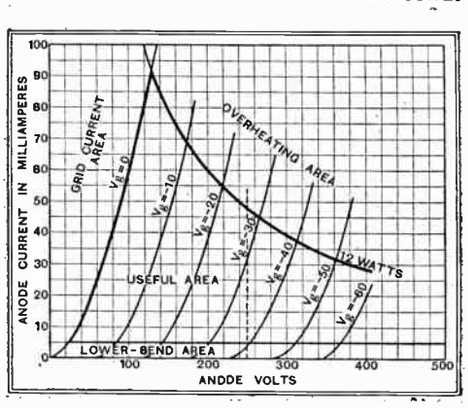


Fig. 2.—Areas that must be ruled "out of bounds" through various causes.

How to Use Valve Load Diagrams.—

300 and 40, and the dots are joined up, a curved line is produced and may be marked "12 watts." The line itself does not represent 12 watts; it indicates that any rectangular area which does not poke above it is within the 12-watt limit.

Having thus laid out the pitch, we are free to move within it. A starting point must be chosen, by selecting the right anode voltage and grid bias, such that the

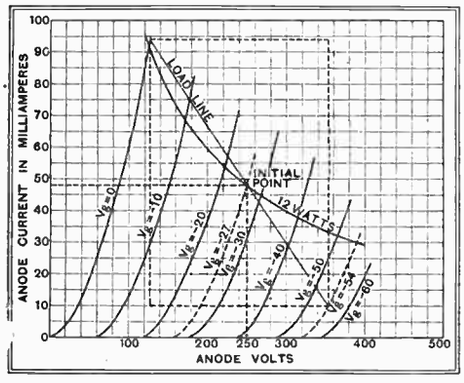


Fig. 3.—Adding the load line and completing the power rectangles.

fluctuations of current and voltage that take place when the valve is working can be represented by a line, the load line, extending each side of it. The object presumably is to get the most out of the valve, and is represented by making the load line as large as possible. The importance of the boundaries begins to appear at this stage. We have seen that the slope of the load line represents its resistance. And in a sense its length represents the output power which is actually delivered to the load, because, being a sloping line, it may be looked on as the diagonal of a rectangular area, and area is power on the diagram (Fig. 3). So, to find the output power, complete the rectangle, either with a pencil or with the eye, and divide the area by 8*.

Drawing the Load Line

The line must not be drawn just anywhere; there are definite rules. The starting point, to which the valve is adjusted by bias or H.T., must be at the centre or very near it. Then next, the load line must cross as many grid volt lines on one side of the initial point as on the other. Thus, if the initial point is at a bias of −30, and it extends to 0 on the one side it must go to −60 on the other; and if it cannot do this and still keeps the initial point within 5 per cent. of its centre, it is disallowed. It is this requirement that calls into existence the boundary at the foot, where the grid voltage lines crowd up together and if used would make the two halves of the load line flagrantly unequal.

The zero-bias boundary must also be strictly respected, and the 12-watt line must not be passed by the fixed initial point, because it would be "caught out" by the excessive rise in temperature. This rise is fairly slow to act, however, and the working point, whose excursions trace out the load line, is able to cross into forbidden territory because it does so only for a fraction of a second and then it is back again before the temperature has time to realise that anything is wrong.

Maximum Power Output

Suppose we take the field and go all out for the full 12 watts that can be put into this particular valve without causing it to get unduly heated. Any point on the 12-watt line represents an adjustment that would cause the valve to draw 12 watts from the supply, but generally the anode voltage is restricted either by the makers' advice or by convenience, and in this valve is taken to be 250. Running upwards from the 250-volt mark to meet the 12-watt line (Fig. 3), the initial point is fixed, and so is the grid bias, which is

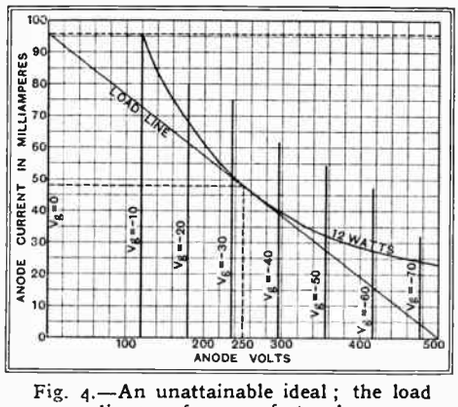


Fig. 4.—An unattainable ideal; the load diagram for a perfect valve.

between −25 and −30; call it −27. And of course the anode current is likewise fixed, at 48 milliamps.

The load line can be drawn to the left until it hits the boundary, in which case it has traversed 27 grid volts. So according to the rules it must go 27 volts in the other direction, to −54.

If the load line is made very steep, almost vertical, it can go a long way up, but only a much shorter distance down, and that breaks the rule which requires the starting point to be within 5 per cent. of the true centre. So to make that right it would be necessary to shorten the line at *both* ends, which is not at all what is wanted. If the line is made nearly horizontal, that is to say, if the loud speaker or other load is very high in resistance, the previous difficulty is avoided, but the area drawn with the line as diagonal is very small. So it is best to choose an intermediate position, like that shown, which makes the initial point come roughly halfway between the two boundaries.

Two dotted rectangles are shown; the one drawn round the load line has an area that represents eight times the useful power put into the load by the valve. The other represents the power put into the valve. If the valve were a perfect device it would give as much as it got, and these would be equal; the load area would be eight times as great as the other one. But the two areas are much more likely to be nearly equal, or at most in the ratio of 2 to 1. So that most of the power put into the valve is wasted.

Looking about, as we all must be in these days, for causes of waste, we see that if the left-hand boundary were removed the load-line area could expand without affecting the input power area. To make the boundary disappear the valve curves would have to be vertical, and as a vertical line means zero resistance, it is the same thing as saying that the valve would have to have no A.C. resistance. This is not practicable, but Fig. 4 shows what the diagram for a perfect valve would look like. It is quite obvious that the load-line area is four times as great as the input power area, so the output is half as great as the input. Thus the maximum efficiency even of a perfect valve is only 50 per cent., provided there is no distortion.

D.C. Dissipation and A.C. Output

The last stipulation is important, because if the valve is operated where the lines crowd up at one end, so as to cause severe distortion, the efficiency is improved.

In Fig. 5, where this effect is represented, it is obvious that the large dotted rectangle around the load line is more than four times the size of the small rectangle in the lower left-hand corner, and therefore the output is more than 50 per cent. of the input. To take an extreme case, if one half of the wave is cut off entirely, so that it must be supplied by another valve, as in the Q.P.P. system, the theoretical maximum efficiency is $\frac{\pi}{4}$, otherwise $\frac{3.14}{4}$, or nearly 80 per cent. That is an advantage entirely in addition

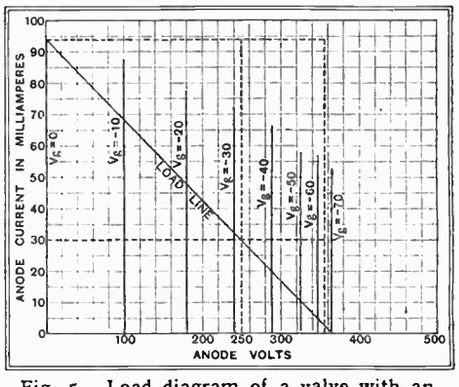


Fig. 5.—Load diagram of a valve with an efficiency of over 50 per cent.

to the primary object of the system, which is to restrict the current to that actually required at any moment, and so avoid letting it run to waste during intervals and quiet passages. Therefore, even when working at full power there is a substantial saving.

Fig. 3 has shown the rather poor actual

* The vertical side of the rectangle represents the current "swing" or twice the peak current, or $2\sqrt{2}$ times the r.m.s. current. Similarly for voltage. So the power output, which is r.m.s. current multiplied by r.m.s. voltage, is equal to current swing × voltage swing.

$$\frac{2\sqrt{2} \times 2\sqrt{2}}{8} = \frac{\text{area of rectangle around load line}}{8}$$

How to Use Valve Load Diagrams.—

efficiency of a triode valve, and Fig. 4 the maximum in an ideal theoretical valve. There is, however, a better approximation to the latter than the triode, and Fig. 6

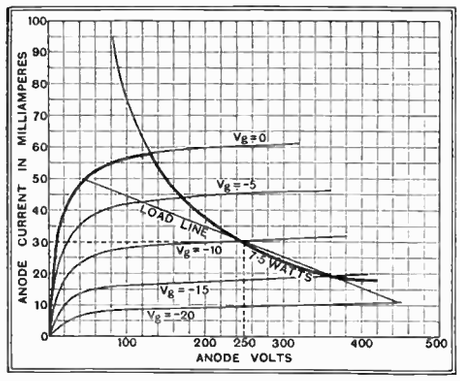


Fig. 6.—Showing why a pentode is inherently more efficient than a triode.

shows how the peculiar shape of the pentode curves pushes back one of the boundaries and gives more room for fitting in a large load line. The anode voltage can swing right down to about 40, whereas the triode of Fig. 3 wastes the first 130 volts. A triode cannot in real life do much better than 20 per cent., but a pentode can do 30 per cent., or even 40 per cent. An efficiency of over 50 per cent. has been claimed, and this condemns itself with its own mouth, because it can be obtained with a single valve only by distortion.

Nevertheless the load diagrams make quite plain why a greater amount of sound can be obtained with a pentode than with a triode, the power supply being the same for both; or alternatively the same amount of sound for less power in the case of the pentode. They also make plain a strong point in favour of Class "B" amplification, employing special triodes in which the grid current restriction is abolished, and with it the lost space on the left. The overheating boundary also is virtually abolished, because at the initial point the anode current is nearly zero, and even when working "all out" the temperature rise is not likely to be anywhere near the danger mark.

Fig. 7 shows a diagram for a Class "B" valve, which is a very close approach to the theoretically perfect. An actual efficiency of well over 50 per cent. is obtainable. It has the unique combination of three claims to efficiency:—

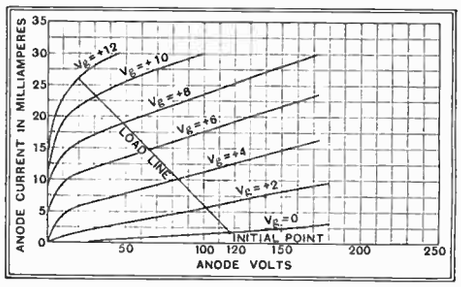


Fig. 7.—Diagram of a Class "B" valve, showing how nearly it approaches the theoretical ideal.

(1) The theoretical limit of efficiency is nearly 80 per cent.
(2) Owing to the shape of the curves this limit is approached more closely than by other valves.
(3) The efficiency at low power is maintained by the quiescent effec

News of the Week

Current Events in Brief Review

A Gift to Listeners

A FREE gift is offered to listeners who pick up the English talk of Mr. Thad Ordon, which he is delivering from the Warsaw broadcasting station tomorrow evening (Saturday), at 9.10 p.m. (G.M.T.). His subject is "The Fifteenth Anniversary of the Polish Republic." To prove that they have actually heard the talk listeners should make their claim for the actual gift to which Mr. Ordon refers. Claims should be addressed to *The Wireless World* to be forwarded to the station.

Indian Arrows for DX'ers

A SET of Indian arrows is to be awarded to the short wave listener in any part of the world who gives the most complete report on the special 42-metre transmission of the International DX'ers Alliance on Monday, November 13th, between 1 and 3 a.m. (G.M.T.). The transmission is made from YV2AM at 7 and 9 p.m. (C.S.T.) on Sunday, November 12th. Reports must be sent to the I.D.A., Bloomington, Ill., not later than December 31st.

Where Denmark Leads

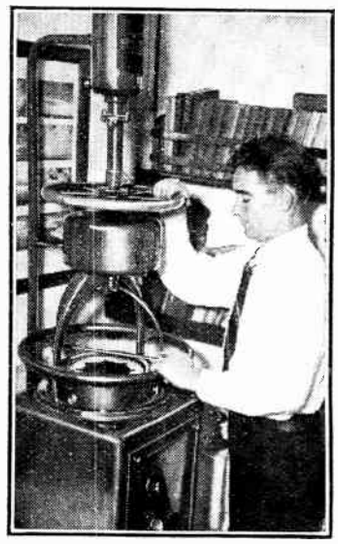
"WHO are the most ardent listeners to foreign programmes?" asks a Continental correspondent. It is believed that the Danes are high on the list, as it is estimated that nine-tenths of Danish listeners are ether-searchers. This must not be interpreted to indicate apathy towards their own programmes, but is in keeping with Denmark's record of being the most "radio conscious" country in Europe. For some years Denmark has had more listeners per head of population than any other country in Europe.

Only a Relay

RADIO-BARI has now lost its individuality, having at last been connected directly by land line with Radio Roma.

Payment to Composers

PROMPTED no doubt by the recent activities of the Performing Right Society in this country, French authors and composers recently met in Paris to discuss "the basis of a proper remuneration" in respect of items broadcast. Now that the new radio tax is bringing millions into the Treasury, the composers consider the time is ripe.



IN TOUCH WITH THE ANT-ARCTIC. The direction finder installed at East Boston, Mass., to enable operators to locate the Byrd Antarctic Expedition during its forthcoming two-year trek across the South Polar regions.

The Beam Link

LAND line maintenance is a difficult proposition in northern Norway, and the broadcasting engineers have abandoned all hope of relying on the trunk line connection between Oslo and Vardö, where Europe's most northerly broadcasting station is being built. So it has been decided to instal a special short-wave beam transmitter for the sole purpose of radiating the programme to Vardo for retransmission. The new station will open early in January.

International Move Against Static

EUROPE is in earnest on the question of eliminating interference with radio reception and the International Electro-technical Commission, which first met in Paris in June last, has now constituted a special committee to get at the heart of the matter. The chairman will be Dr. A. F. Enstrom (Sweden), and seven experts are to be appointed to represent Germany, Great Britain, Holland, Denmark, France, Italy and Rumania. There will also be two representatives of the International Broadcasting Union, and one representative each of the International Union of Producers and Distributors of Electrical Energy, the International Conference of Large High Electric Systems, the International Union of Railways, the International Union of Tramways, and the International Commission of Aerial Navigation.

We learn that the British National Committee of the I.E.E. has been invited to act as Secretariat of the special Committee of Interference, the work to be carried out by the Committee which has recently been appointed by the Institution of Electrical Engineers.

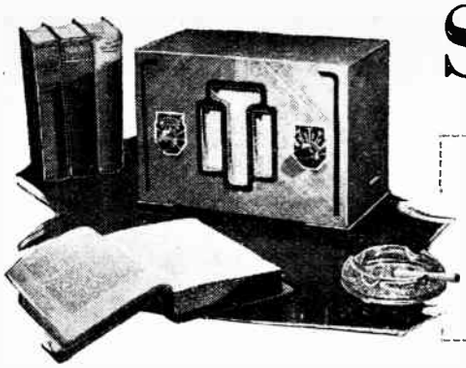
For Every-Day Use

WE live in stirring times and nearly everyone nowadays keeps some sort of record of passing events. *The Wireless World* Diary not only offers the radio user the best means of keeping his "daily log," but supplies a mass of easily accessible information on all matters pertaining to his hobby. The 1934 Diary tabulates all the European wavelengths under the new Lucerne Plan, and includes receiver maintenance record pages, abacs for instantaneous calculations, useful formulæ, wireless symbols, and tested circuit diagrams, in addition to practical hints and comprehensive valve tables. It is obtainable from all booksellers, price 1s. 6d., or from our Publishers, Dorset House, Stamford Street, London, S.E.1, price 1s. 7d., post free.

The Arctic Radio Expedition

THE actual receiver used by the British Radio Expedition to the Arctic Circle was shown in operation on Friday last, October 27th, when Professor Appleton gave an evening discourse at the Royal Institution. The receiver measured the height of the Heaviside and Appleton Layers, using pulses of energy emitted from King's College, Strand.

Professor Appleton showed records of the slides definitely indicating that during magnetic storms, which are of frequent occurrence in Arctic latitudes, electrification at the lowest levels of the Heaviside Layer was increased to such an extent that wireless waves were completely absorbed in this region. Accordingly the Layers could play no part in reflecting them, and this accounted for the frequent inability to transmit wireless waves across the North Pole.



Sunbeam Model M30

FEATURES. ***Type.***—*Midget table model receiver for A.C. or D.C. mains, incorporating a moving coil loud speaker.* ***Circuit.***—*Variable-mu H.F. valve—grid detector—pentode output valve. Half-wave valve rectifier.* ***Controls.***—*(1) Tuning. (2) Volume and on-off switch. (3) Wave-range.* ***Price.***—*7 guineas.* ***Makers.***—*Sunbeam Electric, Ltd., Sunbeam Road, London, N.W.10.*

A Portable Midget Receiver for A.C. or D.C. Mains

MEASURING only 10½in. × 8in. × 5½in., and with a permanently attached flexible aerial lead, this little set makes an ideal "personal" receiver for the home. No earth connection is necessary, and it may be used anywhere within reach of a mains supply point. The power supply circuit is universal, and it can be plugged into either A.C. or D.C. mains without any adjustment other than the obvious precaution of seeing that the voltage plug inside the back of the set is connected to the socket corresponding with the mains voltage. On D.C. mains, of course, the polarity is important, and it may be necessary to reverse the mains plug if the set is unresponsive after the usual warming-up period has elapsed.

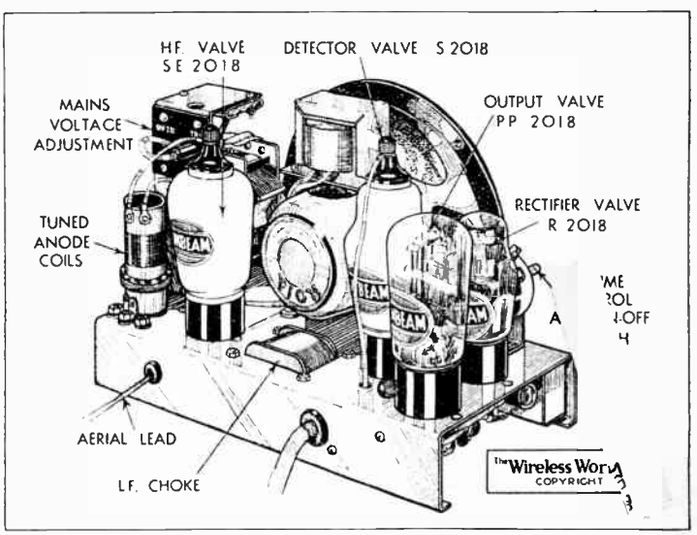
The controls comprise a combined mains switch and volume control on the left, and a tuning control on the right, and a waverange switch at the side of the cabinet. A miniature calibrated scale is provided showing very approximately the wavelength to which the set is tuned. Normally, greater accuracy is not required, as, with the short aerial provided with the set, it is unreasonable to expect to receive stations other than local regionals, and these are easily tuned in by ear without reference to the scale.

Inside a steel-framed building in Central London both Brookmans Park stations came in with adequate strength, but the long-wave stations were not so good, and the outdoor aerial was required to obtain the necessary strength. In a brick-built house a much higher volume level is to be expected on the 25ft. indoor aerial.

An energised moving-coil loud speaker is incorporated, and the quality is pleasant and unmarred by any pronounced bass resonance. Speech is excellent, and the response is able to do justice to all the popular programme items.

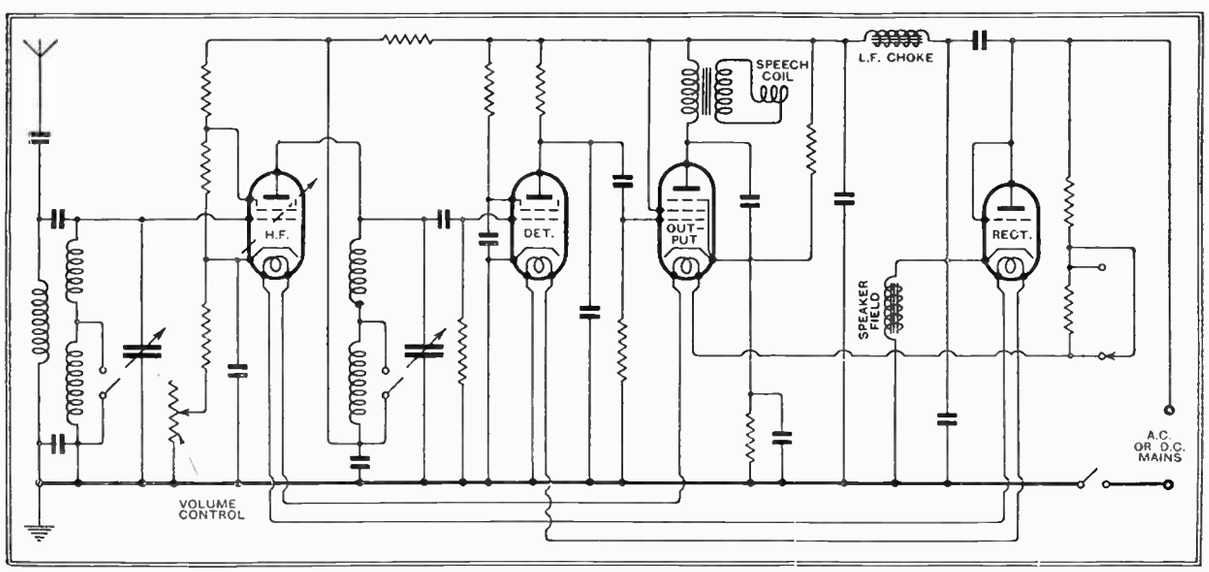
The circuit comprises three stages—a screen-grid H.F. amplifier tuned anode coupled to screen-grid detector and followed by a resistance - coupled pentode output valve. The aerial circuit is isolated by fixed condensers, so that there is no danger from electric shock—an important consideration when the set is used on D.C. mains. Both tuning condensers are accurately ganged, and volume control is effected by varying the bias of the variable-mu H.F. valve.

The valves are of the indirectly heated type, and the filaments, which are rated at 20 volts and 0.18 amp., are joined in series and connected through a voltage-dropping resistance to the mains. The heat generated in this resistance is appreciable and might give rise to trouble if it were mounted inside a cabinet of such small dimensions. The makers have neatly solved this problem by incorporating the resistance in the mains supply cord. This accounts for the slight temperature rise in the cord while the set is working. Naturally, the cord must be treated with more care than is generally shown to flex, but if, for any reason, it should fail, a replacement can be obtained from the makers. Incidentally, a very full range of spares is listed, and the instructions folder gives the normal voltage readings at different points in the circuit.



An energised moving coil loud speaker is incorporated in the chassis. Tungsram valves are used throughout.

The half-wave rectifier for A.C. consists of a triode with the grid and anode strapped together. It is connected in series with the supply, and there is thus nearly the full H.T. voltage between the heater and cathode. These valves, however, are well able to withstand the voltage at this point. The loud speaker field is connected in parallel with the H.T. supply, and a separate choke is used for smoothing. On A.C. mains the hum is inaudible at a distance of more than two feet.



Complete circuit diagram. The series filament resistance is integral with the mains supply lead.

Next Week's Set Review: CLIMAX S.4.

Practical HINTS and TIPS

MANY users of D.C. mains sets who are considering the fitting of a gramophone pick-up are probably unaware that certain precautions should be taken when making this addition. The external pick-up connections may be at a high potential with respect to earth, and so something must be done to avoid the risk of shock or possible damage; clearly, complete isolation, from the D.C. point of view, must be provided between the pick-up and the mains.

Isolating the Pick-up

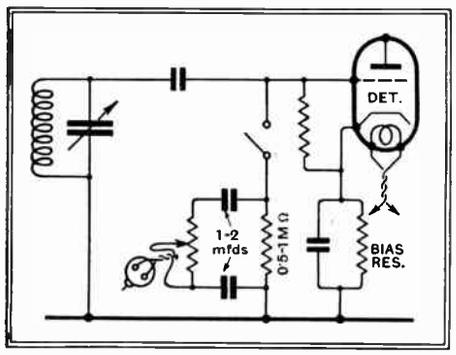


Fig. 1.—Unless isolating condensers are fitted, a gramophone pick-up connected to a D.C. mains set will be "live"; with a positively earthed supply damage may be caused.

The simplest way of doing this is to fit a double-wound transformer, but unfortunately suitable components for this special purpose are not readily available. As an alternative, there remains the method of isolating shown diagrammatically in Fig. 1. Here D.C. potentials are "blocked off" by a pair of condensers, which, of course, should be housed inside the receiver itself. It must not be forgotten that in order to prevent a choked grid circuit a leak of from ½ megohm to 1 megohm must be fitted as shown.

IT does not seem to be generally realised that the amount of smoothing required in a mains-operated receiver is more or less directly in proportion to the amount of amplification—particularly L.F. amplification. For instance, the mains equipment of a typical modern set, in which the detector feeds direct into the output valve, would almost always prove to be hopelessly inadequate if the owner for any reason decided to increase L.F. magnification by fitting an intermediate stage between the detector and output valves.

Amplification and Smoothing

This explains why the D.C. Superhet recently described in these pages is proving so successful in cases where mains hum is usually found extremely difficult to eradicate. Although the new set has sufficient H.F. and I.F. amplification to provide more than usual sensitivity, the L.F. magnification is probably less than that of any other receiver described in *The Wireless World*, except those in which a pentode performs the combined function of detector and output valve.

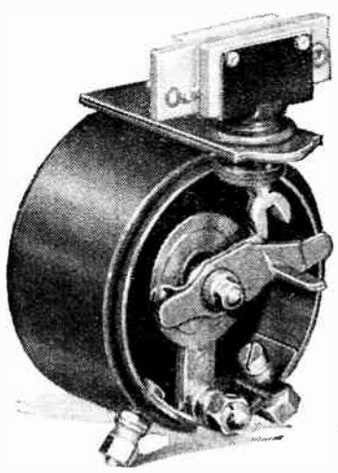
AIDS TO BETTER RECEPTION

USERS of superheterodynes with the modern style of I.F. amplifier are inclined to forget that the quality of reproduction is controlled largely by the degree of coupling between the component circuits of the I.F. transformers. If, for example, reproduction is unduly low-pitched, the defect may well be due to an excessively tight coupling, and the effect of moving the coils farther apart may be tried with every hope of success. Conversely, a deficiency in the bass register may sometimes be partially corrected by a judicious increase in the spacing between the windings.

Coupling Influences Quality

IT is sometimes convenient to be able to maintain artistic continuity by "fading out" a radio programme in favour of a gramophone record, or *vice versa*. To make provision for doing this is by no means a difficult matter, at any rate in a short-range "quality" receiver, and probably the simplest way of arranging for an imperceptible change from one method of reproduction to another is that shown diagrammatically in Fig. 2. A tapped potentiometer will be required; usually the extra connection may be made with a little ingenuity on the resistance element of most commercial components.

Radio-to-gramophone Fader



A ganged switch rearranged to break contact at an intermediate position of the potentiometer slider travel.

The operation of a fader is quite simple and easy to understand. It will be realised that, with the slider at point Y, the grid circuit of the valve will be virtually short-circuited, and so there will be nothing fed to it, either from the "radio" or "gramophone" sources. On moving the slider upwards towards point X, the strength of radio signals will be progressively increased from minimum to maximum. Conversely, moving the slider downwards from point Y towards Z will result in the application of an increasing proportion of the pick-up output to the grid.

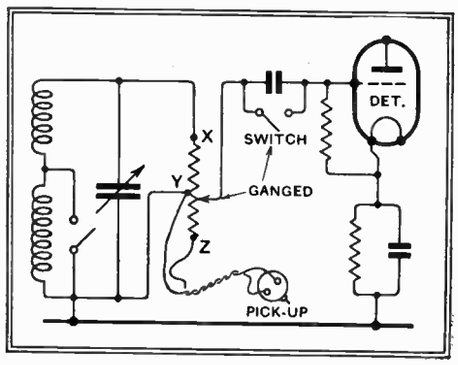


Fig. 2.—A tapped potentiometer with ganged switch, arranged to give continuous volume control and automatic change-over for both gramophone and radio reproduction.

It is necessary that the detector-grid condenser should be short-circuited automatically at the precise moment when the slider passes from the "radio" section of the potentiometer to the "pick-up" section. This can conveniently be done by means of a switch built on to the potentiometer, and it is very often possible to arrange matters so that the switch, instead of breaking or making contact at the extreme end of the travel of the contact brush, will do so at any desired intermediate position. This is shown in the accompanying illustration.

The resistance of the potentiometer between points X and Y should not be appreciably less than 0.25 megohm; between Y and Z it should be that specified by the makers of the pick-up.

THERE is no reason why automatic volume control, if fitted properly and in good working order, should impair the maximum sensitivity of a receiver to the slightest extent. If the addition of A.V.C. seems to be responsible for a reduction in sensitivity, it is advisable to measure the individual anode currents of the controlled valves when no signal is coming in; if current be abnormally low the implication is that the "standing" bias of these valves is excessively high. With certain systems, a defect of this nature may be due to incorrect biasing of the controlling valve.

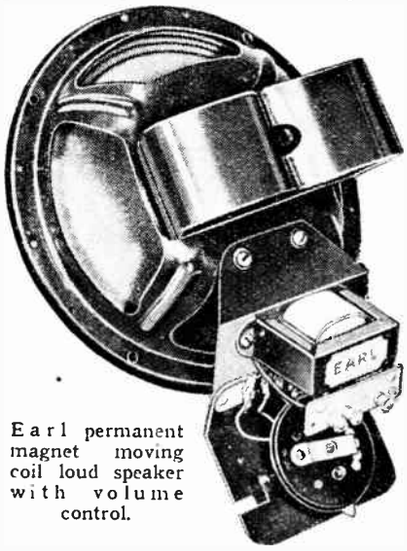
Loss of Sensitivity

NEW APPARATUS REVIEWED

Latest Products of the Manufacturers

EARL P.M. LOUD SPEAKER

THE latest models of this loud speaker are fitted with a volume control which has been designed to maintain the frequency response irrespective of the setting of the



Earl permanent magnet moving coil loud speaker with volume control.

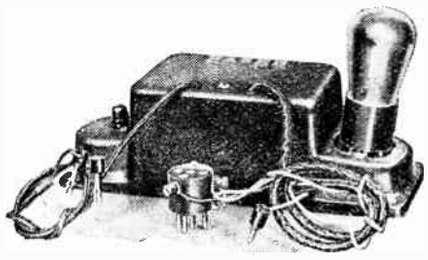
control. It takes the form of a low-resistance potentiometer between the secondary winding of the output transformer and the moving coil. In the maximum position the switch arm is arranged to disconnect the potentiometer resistance so that the full efficiency of the unit is available. At the other end of the range, the primary winding of the transformer is open-circuited, thus facilitating the addition of an external loud speaker to the set.

The unit tested had a useful frequency response from 75 to 4,500 cycles with a principal diaphragm resonance at 95 cycles and a region of increased output around 2,500 cycles. The special method of mounting the cone evidently gives greater freedom of motion, and the volume control does not appreciably affect the balance of tone.

The makers are the Earl Manufacturing Co., Ltd., Avenue Works, Hanover Park, Peckham, London, S.E.15, and the price of the unit with volume control is £2 10s.

BAKER'S CLASS "B" CONVERTER

MADE by Baker's Selhurst Radio, 75 and 77, Sussex Road, Croydon, Surrey, this unit provides a ready means for con-



Baker's Class "B" conversion unit.

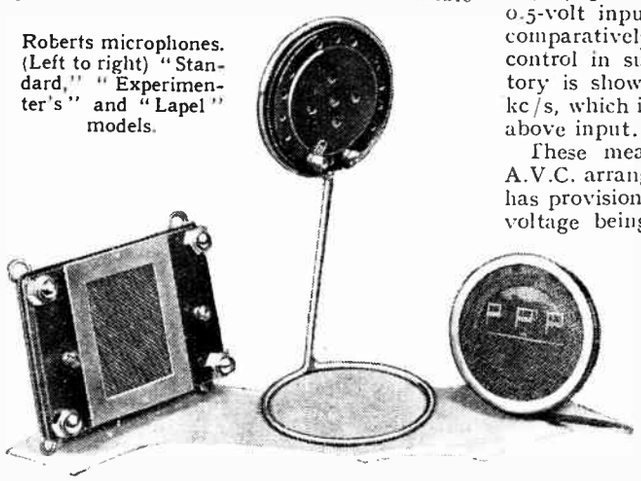
verting an existing battery set to Class "B" working. An increase in the power output of the order of six times as compared with a low-power triode may be expected, yet very little extra will be required from the H.T. battery. Indeed, a saving might actually accrue, for the average anode current of the Class "B" valve will rarely exceed seven milliamps.

The unit does not replace the existing output stage, but is used in addition thereto, but this now becomes the driver stage for which a low-power triode of about 150 milliwatts output will suffice. This valve is fitted to an adaptor which plugs into the output valve-holder; the cable joined to this plug has woven with it a lead supplying H.T. to the unit. To operate the unit to the best advantage an H.T. battery of 130 volts is required, but quite good results are obtainable with but 100 volts.

The price of the converter is 37s. 6d. without valve, and it can be obtained fitted with a carefully matched Baker's Permag moving-coil loud speaker for 75s. This does not include the valve.

THE ROBERTS MICROPHONE

THE salient feature of these microphones, which are of the carbon type, is that granules are enclosed between two flexible



Roberts microphones. (Left to right) "Standard," "Experimenter's" and "Lapel" models.

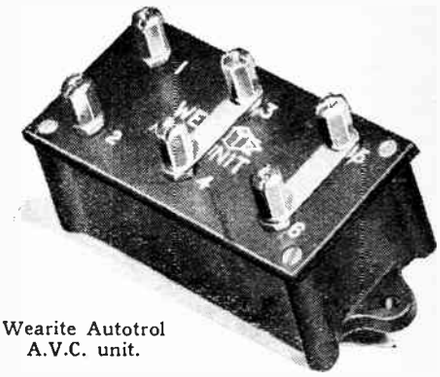
diaphragms instead of the usual single diaphragm with solid back plate. The advantages claimed for this arrangement are that the microphone is practically non-directional, and, in the case of sound waves impinging on the instrument at an angle, the phase difference between the pressure on the front and back results in increased efficiency, particularly at high frequencies.

The standard rectangular model measures 4in. × 2¾in. and is ⅜in. thick. There is a public speaker's model designed to pin on to the lapel of the coat, and an experimenter's model which should be of interest to amateur transmitters. The latter costs 12s. 6d., and is rubber-sprung in a neat wire stand.

The instruments are designed and made by Capt. A. J. Roberts, 89, Wardour Street, London, W.

WEARITE AUTOTROL UNIT

THE Autotrol Unit has been introduced by Wright & Weaire, Ltd., 740, High Road, Tottenham, London, N.17, with the view to providing the means for incorporating A.V.C. in receivers with the minimum of alteration and trouble. It is well suited for use in existing receivers, particularly superheterodynes, as the A.V.C. voltage provided is not constant at all frequencies, the highest output being obtained when it is supplied from a source of H.F. at a comparatively low radio frequency.



Wearite Autotrol A.V.C. unit.

A measure of control is available, however, on the normal wavelengths, and the measured values obtained on test were 1.3 volts at 1,200 kc/s (250 metres), 2.9 volts at 600 kc/s (500 metres), and 7 volts at 200 kc/s (1,500 metres). These were given with 0.5-volt input to a leaky grid detector of comparatively high amplification. That the control in superhets will be most satisfactory is shown by the D.C. output at 110 kc/s, which in our case was 8.5 volts for the above input.

These measurements were for a simple A.V.C. arrangement, but this particular unit has provision for delayed A.V.C., the delay voltage being obtained from a small grid cell joined to two of the unit's terminals. The scope of the Autotrol is further widened by provision for manual control of the bias voltage fed to the controlled valves, a most useful feature especially where the ordinary type of screen-grid valve with a short grid base is employed.

This unit will serve admirably as an anti-fading device in short-wave sets, yet, despite its versatility, the price is but 10s. 6d.

GOLTONE STAND-OFF INSULATOR

AN insulating pillar has a multitude of uses, particularly in short-wave work, for it will serve for mounting coils, metres, and sundry other components where it is desirable to raise these above the baseboard. A device of this nature is made by Ward & Goldstone, Ltd., Frederick Road (Pendleton), Salford 6, Lancs, and is known as the Low Loss Stand-off Insulator.

Goltone low loss stand-off insulator.

It is made of a porcelain compound, has very good insulating properties, and measures 2 1/16in. diameter at the base and is 1⅛in. high. A 2BA screw with fixing nuts is provided, but if desired this could be removed and a length of 2BA rod employed instead. The price is 9d.

READERS' PROBLEMS

THESE columns are reserved for the publication of matter of general interest arising out of problems submitted by our readers. Readers requiring an individual reply to their technical questions by post are referred to "The Wireless World" Information Bureau, of which brief particulars, with the fee charged, are to be found at the foot of this page.

High-output D.C. Set

WE are asked to state the approximate output of the "Wireless World" D.C. Superhet described recently in these pages.

The receiver in question gives more volume than the average D.C. receiver; its undistorted output under average working conditions amounts to about 1.8 watts.

Manual and Automatic Control

IN order that an A.V.C. system may work at its best, it is just as well that the pre-detector section of the receiver should always operate at maximum sensitivity until a carrier wave sufficiently strong to de-sensitise it is received. It will therefore be seen that any form of manual volume control which affects the H.F. (and generally the I.F.) amplifier is therefore more or less ruled out.

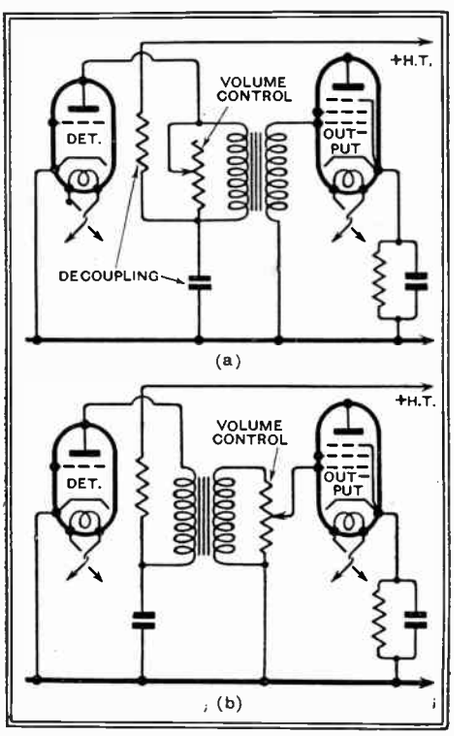


Fig. 1.—Diagram (a) shows the most practical form of L.F. volume control for a transformer-coupled L.F. stage. The other arrangement, suggested by a querist, is not recommended.

A reader has confirmed the truth of this statement by experience; although the H.F. manual control which he has fitted works up to a point, it is found to be inconvenient. Accordingly he proposes to fit an L.F. control, and asks whether a high-resistance potentiometer across the L.F. transformer secondary would be satisfactory.

To impose a load on the *secondary* of any L.F. transformer is distinctly dangerous, and is almost certain to be productive of poor quality. A much better plan would be to connect a variable resistance of 50,000 ohms or so across the *primary* winding, as shown in Fig. 1 (b).

When dealing with a set such as that used by our correspondent (with a single transformer-coupled L.F. stage), the addition of post-detection volume control is always something of a problem. When any form of diode detection is employed, however, this difficulty disappears entirely, as the diode load resistance may be in the form of a potentiometer, from which any desired proportion of the total rectified voltage may be picked off for application to the L.F. amplifier.

Electrostatic Speakers

A GOOD deal of uncertainty seems to exist as to the type of receiver with which an electrostatic loud speaker may be used satisfactorily; some correspondents seem to be under the impression that a highly specialised set is necessary. This is a mistake, and there is no basic reason why any receiver should not be employed with one of these instruments, provided that a polarising voltage of 200 volts or more is available. In practice, of course, it is desirable that the receiver should have a good response in the middle and upper registers.

A Choice of Positions

WE are asked to give a ruling as to the best position for a band-pass filter in a "straight" receiver with one H.F. stage. The querist who raises this point has noticed that in a number of receivers (including several described constructionally in this journal) the filter is employed as an inter-valve coupling, instead of in the aerial input circuit.

This is a matter about which designers have not yet reached full agreement. Briefly, there is a good deal to be said for retaining the filter in the aerial-grid circuit, where it reduces the possibility of cross modulation or similar forms of interference. In the inter-valve circuit, increased stability, greater freedom from background "hiss," and better ganging, are likely to be obtained, although the latter advantage may disappear when much use is made of reaction.

Non-Oscillation

CONSTRUCTORS of the New Monodial receiver, who suspect that the oscillator is failing to function at all tuning positions, should make quite sure that the heater of the combined detector-oscillator valve is operating at the recommended working voltage. This point is easily checked with the help of a good A.C. voltmeter. Failing a proper measuring instrument, it will almost always be safe to short-circuit two or three turns of the series-connected heater resistance when signs of non-oscillation are present.

The Wireless World INFORMATION BUREAU

THE service is intended primarily for readers meeting with difficulties in the construction, adjustment, operation, or maintenance of wireless receivers described in *The Wireless World*, or those of commercial design which from time to time are reviewed in the pages of *The Wireless World*. Every endeavour will be made to deal with queries on all wireless matters, provided that they are of such a nature that they can be dealt with satisfactorily in a letter.

Communications should be addressed to *The Wireless World* Information Bureau, Dorset House, Stamford Street, London, S.E.1, and must be accompanied by a remittance of 5s. to cover the cost of the service. The enquirer's name and address should be written in block letters at the top of all communications.

Directional Effects Negligible

OLD fallacies die hard, and the belief is still widely held that the "pick-up" of an aerial is appreciably affected by the direction in which its horizontal span lies.

So far as ordinary broadcast receiver aerials are concerned, the directional effect is negligible. This effect only becomes evident with large aerials, with a length many times greater than their height.

Investigation of several cases where marked directional effects have been noticed has shown that an absence of local screening in one direction only is almost always responsible.

Grid Decoupling

THE somewhat elaborate system of grid-circuit decoupling employed until recently has now been almost completely superseded by the much simpler expedient of shunting the bias resistance with a dry electrolytic condenser of high capacity but low working voltage. A capacity of between 20 and 50 mfds. is customarily employed for this purpose, and the scheme is, of course, applicable only to true self-biased circuits where the necessary voltage is developed across a resistor inserted in the cathode lead of the valve concerned. This arrangement is shown in Fig. 1 (a).

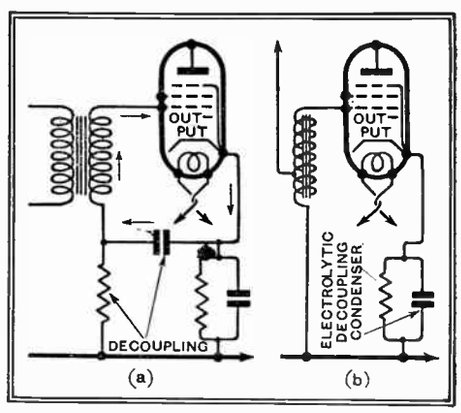
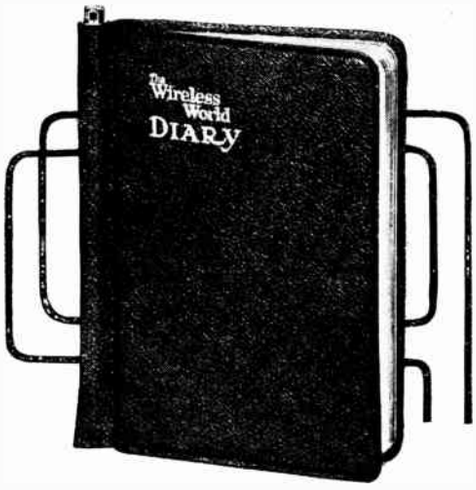


Fig. 2.—The conventional grid decoupling circuit, where signal-frequency energy is restricted to the path indicated by arrows. Diagram (b) shows a simpler and often more effective method.

These remarks are prompted by a letter from a reader who asks us to criticise the circuit diagram of his proposed receiver. Except for the bias circuit, everything is in order, but a resistance-fed auto-transformer is to be employed, and so the conventional decoupling scheme proposed would be quite ineffective. Even with other forms of L.F. coupling, the simple high-capacity by-pass condenser is now considered to be best for purposes of decoupling.

A Combined Diary and Reference Book for every keen Amateur



Compiled by the staff of "The Wireless World"

The Wireless World DIARY for 1934

As a convenient source of information on many aspects of wireless theory and practice, this handy little Diary, now in its tenth year of publication, is unique. In addition to the usual diary pages—one week at an opening—there are 78 pages of facts, figures and explanations. These include sixteen pages of circuit diagrams of complete receivers and details of receivers, including battery economy circuits dealing with Class B, QPP, and other methods, and devices for suppressing mains interference.

Summary of Regulations Controlling Receiving Licences. Broadcasting Stations of Europe (Lucerne Plan, Jan. 15th, 1934). Principal Short-wave Broadcasting Stations of the World. Receiver Maintenance Records. Diary for 1934 with weekly notes and dates of principal events in wireless history. Symbols in Common use. Useful Formulæ, and Abac for calculating Decibels. Sundry Abacs (Frequency and Wavelength, Ohms law, etc.). Copper Wire Tables. Conversion Tables. Symbols used in Wireless Diagrams. Circuit Diagrams and Notes. Tracing Hum. Coil Winding Data. Practical Hints and Tips. Matching Output Valve and Loud Speaker. Valve Data.

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- "An extended test confirms my early impression of the remarkable evenness of response."
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- "Anyone need not go any further than a PM4a of 'W.B.' as they could not get anything better at three times the price."
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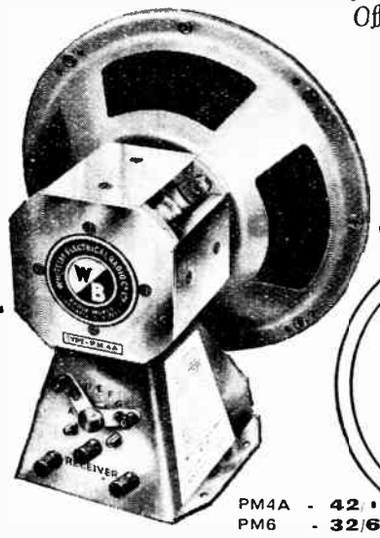
"The 'Microlode' feature providing the even balance of tone which only accurate matching can ensure—

"And the innumerable small points of superiority which together, place the speaker in a separate class.

Until you hear one on your own set you will never realise what a difference this speaker can make.



Write to-day for the folder of W.B. Speakers.

PM4A - 42/-
PM6 - 32/6

"MICROLODE" MOVING-COIL SPEAKERS

Whiteley Electrical Radio Co. Ltd., Dept. W, Radio Works, Mansfield, Notts.

MISCELLANEOUS ADVERTISEMENTS

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ADVERTISEMENTS for these columns are accepted up to **FIRST POST** on **MONDAY MORNING** (previous to date of issue) at the Head Offices of "The Wireless World," Dorset House, Stamford Street, London. S.E.1, or on **SATURDAY MORNING** at the Branch Offices, 19, Hertford Street, Coventry; Guildhall Buildings, Navigation Street, Birmingham, 2; 260, Deansgate, Manchester, 3; 26b, Renfield Street, Glasgow, C.2.

Advertisements that arrive too late for a particular issue will automatically be inserted in the following issue unless accompanied by instructions to the contrary. All advertisements in this section must be strictly prepaid.

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The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

PILOT AUTHOR KITS

Exact to Specification

AS FOUNDERS OF CONSTRUCTORS' SETS IN 1919, we have established a world-wide reputation for the supply of Complete Kits and Part Kits for all "Wireless World" Set designs. An essential feature of this Expert Service to the Home Constructor is IMMEDIATE DELIVERY FROM STOCK—CASH or C.O.D.—of any exclusively specified or difficult to obtain components. Rely on PETO-SCOTT, he always gives fullest satisfaction to every customer.

A.V.C. THREE

Kit 'A'—Author's Kit of First Specified Parts, including Peto-Scott Plymax Chassis and Ply Panel, assembled and drilled, less valves and cabinet.

Cash or C.O.D. Carriage Paid. **£10-15** *or 12 monthly payments of 19/9.*

Kit 'B'—As Kit 'A' with Specified Valves, but less Cabinet Cash or C.O.D. Carriage Paid **£14-1-6**

or £2-1-6 Deposit and 11 monthly payments of 24/-.

Kit 'C'—As Kit 'A' but with Valves and recommended PETO-SCOTT Table Cabinet. Cash or C.O.D. Carriage Paid **£15-6-6**

or Deposit £3-6-6; Balance in 11 monthly payments of 24/-.

KIT-BITS

Selected C.O.D. Items. You pay the postman. We pay post charges all orders value over 10/-.

		£	s.	d.
1	J.B. "Nugang" No. 2064 3-gang Variable Condenser and Disc Drive	1	2	6
3	WEARITE "Nucleon" Coils, B.P.1, B.P.2, T.C.	1	17	6
1	MULTITONE "Toco" Transformer 1:4		17	6
1	DAVENSET No. 101 Power Smoothing Choke		16	0
1	VORTEXION Type AC34 Mains Transformer		18	0
1	PETO-SCOTT Plymax Baseboard, 12×15×2½in.		11	6
	Set of Specified Valves	3	6	6
	Specified PETO-SCOTT Cabinet	1	5	0

ALWAYS BUILD ON PLYMAX

PETO-SCOTT PLYMAX CHASSIS AND PLY PANEL SOLELY SPECIFIED. Plymax Chassis as specified by the Author, drilled and assembled, 15"×12"×2½". Cash or C.O.D. Post and Packing 1/3 extra. **14/-**

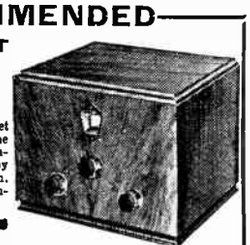
FINISHED INSTRUMENT

A.V.C. THREE—Ready Assembled exact to Author's Specification with Valves and Cabinet. Aerial Tested. Cash or C.O.D. Carriage Paid **£17-17-0**

or £2-17-0 Deposit and 11 monthly payments of 30/-

RECOMMENDED

PETO-SCOTT WALNUT A.V.C. THREE CABINET



A Handsome figured Walnut Cabinet specially recommended for the A.V.C. Three. Constructed throughout with well-seasoned timber by London's leading piano craftsmen. Front ready drilled for panel controls. Cash or C.O.D. Carriage Paid. Size 15"×12"×8½". **25/-**

SEND FOR 1934 CABINET CATALOGUE

We SPECIALISE in Finished Instruments of all "Wireless World" Sets. Built exact to specification in Customers' own special cabinet designs if required. Send full details for quotation by return.

NEW MONODIAL

KIT 'A.'—Author's Kit of First Specified Parts for RECEIVER PORTION ONLY, including Peto-Scott assembled and drilled Plymax Chassis, Panel, less cabinet and valves.

Cash or C.O.D. Carriage Paid. **£11-12** *or Deposit £1.12.0 and 11 monthly payments of 20/-*

KIT 'B.'—As Kit 'A.' but with Valves for RECEIVER PORTION ONLY. Cash or C.O.D. Carriage Paid. **£15.18.0** *or Deposit £3.8.0 and 11 monthly payments of 25/-.*

COMPLETE KIT comprising complete SET and POWER UNIT PORTIONS with specified valves. Cash or C.O.D. Carriage Paid. **£27.18.6** *or £5.18.6 Deposit and 11 monthly payments of £2.4.0.*

IMMEDIATE DELIVERY

CASH — C.O.D. — H.P.

FOREIGN ORDERS. Send one-third value of goods with order. Balance (including forwarding charges) payable to our forwarding agents on delivery. Insurance effected if desired. All orders carefully executed and expertly packed by special export staff.

PETO-SCOTT CO. LTD.

77, CITY ROAD, LONDON, E.C.1.

West End Showrooms: **62, High Holborn, London, W.C.1**

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For the convenience of private advertisers, letters may be addressed to numbers at "The Wireless World" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Wireless World." All replies should be addressed to the Box number shown in the advertisement, c/o "The Wireless World," Dorset House, Stamford Street, London, S.E.1. *Readers who reply to Box No. advertisements are warned against sending remittance through the post except in registered envelopes; in all such cases the use of the Deposit System is recommended, and the envelope should be clearly marked "Deposit Department."*

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Readers who hesitate to send money to advertisers in these columns may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Wireless World," both parties are advised of its receipt.

The time allowed for decision is three days, counting from receipt of goods, after which period, if buyer decides not to retain goods, they must be returned to sender. If a sale is effected, buyer instructs us to remit amount to seller, but if not, seller instructs us to return amount to depositor. Carriage is paid by the buyer, but in the event of no sale, and subject to there being no different arrangement between buyer and seller, each pays carriage one way. The seller takes the risk of loss or damage in transit, for which we take no responsibility. For all transactions up to £10, a deposit fee of 1/- is charged; on transactions over £10 and under £50, the fee is 2/6; over £50, 5/-. All deposit matters are dealt with at Dorset House, Stamford Street, London, S.E.1, and cheques and money orders should be made payable to Iliffe & Sons Limited.

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RECEIVERS AND AMPLIFIERS, ETC.

MILDMAY RADIO EXCHANGE Offers the Following, sound and perfect and as stated:—

1933 Brownie 3-valve A.C. Mains Receivers, with valves and in sealed boxes, specification: screen grid, detector, pentode output, in beautiful figured walnut cabinet, suitable for A.C. mains 200-250 volts; £6/10 each, original list price £15/15; special terms to trade.

'PHONE Demonstration: Clissold 5001.

OPEN Thursday, closed Saturday all day

ALL Carriage Paid.

24, Mildmay Grove, London, N.1. [3800

SOME New 4-valve A.C. Sets in Cabinets, without valves, R.C. coupled; 50/- each.—Radio Furuiture, 106, Victoria St., S.W.1. [3856

B.T.H. Amplifiers.—Small type A.C./H.L., A.C./P., and 2-A.C./P.1's in push-pull volume control, etc.; £3 each, complete with valves.

12-WATT Type, with 2-P.P.5/400's push-pull in output stage; £15, brand new.

B.T.H. Pick-up Tone Arms, 3/-; carriage paid cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Advance 3668 [3773

FULLY Automatic Radiogram, A.C. mains, suitable home club, cafe; cost £220, best cash offer secures.—Neilson, 373, Edgware Rd., W.2 [3864

MURPHY A8 8-valve Superhet, complete with pedestal, in new condition, only 9 months old; 15 guineas; serial No. 4639.—York, Montagu St., Kettering. [3850

OSTAR Ganz Combined A.C./D.C. All-electric Set, 3 valves and Magnavox moving coil, in walnut cabinet; listed £11/11, our price £4/19/6; c.o.d., carriage paid.—Kay, 167, City Rd., London, E.C.1. [3815

A.C. Superhet, 9 kc. separation, short wave adaptor built in, calibrated scale, chassis built with finest material, 6-watt undistorted output, complete with 7 matched B.V.A. valves; £15.—White House, Rosehill Park West, Sutton, Surrey. 'Phone: 4591. [3871

ARMSTRONG 1934 Universal A.C.-D.C. 4v. Chassis, incorporating 3 tuned circuts, 9 kilocycle separation, giving practically superheterodyne performance, full vision scale, one knob tuning, combined one knob switching, 1½ watts output, 75/-; with valves, 114/-.

ARMSTRONG Latest 4v. A.C. Chassis, 3 tuned circuits, 9 kilocycles separation, square peak, single knob tuning, high frequency pentode, power grid detection, multi-grid 2½ watts output, ideal for making radiogram, 79/-; with valves, 118/-; both models fully guaranteed, 7 days' trial, demonstration any time.—'Phone: Gulliver 3105. Armstrong Co., 100, King's Rd., N.W.1. [3883

COLUMBIA Bargains.—Model 306 4-valve suitcase portable (13 guineas), £5; 309 2-valve 2-station (12 guineas), £2; 304 5-valve S.G. table model (28 guineas), £5; 326 M.C. speaker for above (20 guineas), £5; 331 3-valve S.G. Pedestal (30 guineas), £8; 310 3-valve Radiogram (40 guineas), £15; 308 5-valve Radiogram (65 guineas), £15; 302 5-valve Radiogram (90 guineas), £20; 602 4-valve Radiogram (32 guineas), £12; 503 5-valve Radiogram (40 guineas), £14; state A.C. or D.C. required.—Rogers' Radio, Lowestoft. [3870

Receivers and Amplifiers, Etc.—Contd.

"WIRELESS World" Modern Quality Amplifier, "Parmeko" mains components, guaranteed new and perfect, £12; Colaro motor, Marconi pick-up, mounted, and new writing desk cabinet optional; U.8 valve, 10/-; L.S.C.A., 12/6; both O.K.—Jennings, "Ingledell," Flackheath, High Wycombe. [3853

MAINS EQUIPMENT

VORTEXION Lead Again.

VORTEXION A.C./34, used by author in construction of A.V.C. Three, as illustrated, 18/-.

VORTEXION, Wimbledon, for 99.9% reliable transformers.

IF You Haven't Tried Them Yet Ask Someone Who Has, or call and inspect complimentary letters.

GUARANTEED 12 Months, and within 5% normal and 2½% super models, neat shrouding, with detachable feet, as used by Government Departments, etc., etc.

VORTEXION.—New Monodial transformer, 200-250, 50 cycles, 425-0-425, 120 m.a., 4v. C.T. 3a., 4v. C.T. 1a., 4v. C.T. 1a., 4v. C.T. 6a., screen primary, open type, 20/-; shrouded, 22/-; super shrouded, 26/-; weight 14lb., carriage 2/- extra; 10 henry choke, 5/6, post 9d.; 20 henry, 8/6.

VORTEXION.—5-watt Monodial A.V.C. model, 400-0-400, 120 m.a., 4v. 6a., 4v. 3½a., 4v. 2a., 4v. 1a., super screened, 20/-; shrouded, 24/-.

ALL Secondaries Centre Tapped.

VORTEXION.—250-0-250 60 m.a., 4v. 1 to 2a., 4v. 2 to 4a., open type, 10/6; shrouded, 12/6; post 9d.

VORTEXION D.C.4 Choke, specified for D.C. superhet; 8/6.

VORTEXION Transformers, tested with 2,000 volts between windings.

VORTEXION.—Ferrocart III, 350-0-350, 60 m.a., 4v. 2.5, C.T., 4v. 3.5, C.T.; open type 13/6, shrouded 16/-; post 9d.

VORTEXION.—Super model for H.T.8 or 9 or 10, 4v. 1 to 2, 4v. 2 to 4; open type 14/6, shrouded 16/6; post 1/-.

VORTEXION.—350-0-350, 120 m.a., 4v. 2 to 5a., 4v. 2 to 4a., 4v. 2.5a.; open type 14/6, shrouded 16/6.

VORTEXION.—400 or 450 or 500v., 120 m.a., 4v. 2 to 5, 4v. 2 to 5, 4v. 2 to 5; open type 19/-, shrouded 23/-.

VORTEXION.—400 or 450 or 500, 150 m.a., 4v. 4a., 4v. 2.5, 4v. 2, 4v. 2, 4v. 2, core size 2¼×1¼in., a superb job, 2% regulation, 35/-; shrouded with terminals, less terminals, 30/-, open type 26/-; post 1/3.

VORTEXION Auto Transformers to B.E.S.A. Specification, 100, 110, or 120v. to 200, 220 or 240 volts, 60 watts, 9/-, post 9d.; 120 watts, shrouded 12/6, open type 10/6, post 1/-; 200 watts, open 14/6, shrouded 16/6, post 1/-; 2,000 watts, £4/10.

VORTEXION 600-watt Transformers; £4/10, carriage free.

VORTEXION 30h. at 60 m.a. Chokes, 5/6; 40h. at 60 m.a., 8/6; 30h. at 150 m.a., 200 ohms, 10/6 open type, 12/6 shrouded.

VORTEXION Transformers Made to Your Specification; price according to wattage, 6v. filaments same price unless wattage grossly exceeded; special quotations by return.

VORTEXION (S. A. BROWN), 182, The Broadway, Wimbledon, S.W.19. Tel.: Liberty 2814. [3820

Mains Equipment.—Contd.

N.P. Battery Chargers for A.C. Mains; trade lists free.

N.P. Make Chargers to Suit Requirements; send for prices; we are the lowest in the trade.

N.P. Advise on all Matters of Battery Charging with Diagrams and Instructions.

N.P. Have a Few Slightly Soiled Travellers' Models, bargains for cash; trial 7 days; satisfaction or cash refunded.

N.P. Special Charger This Week, 30v. 6 amps., 3 circuits; £7/15; cannot repeat.

N.P. Have One 2.8b.h.p. A.C. 3-phase Motor, 200-250; bargain, £6, in perfect condition.

N.P. Send Trade Lists and Photographs of Battery Chargers, from 62 6 to £17/10, suitable for large tations.—Nash Products, Ltd. (Dept. W.W.), Stechford, Birmingham, 9. [3901

A.C. CHARGERS Supply the Latest Models in Battery Charging Plants.

A.C. Will Send Trade Literature, with prices of models with 4 circuits H.T. and L.T., 0-½, 0-1, 0-1½, 0-3 amp., 30 volts on each, will charge 120 volts H.T. and 30-100 L.T. batteries at once for 1/-; price £10/12/6.—A.C. Chargers, 22, Hall St., Willenhall, Staffs. [3770

HOYNE'S Transformers and Chokes the Best Obtainable, perfect insulation, regulation and reliability.

HOYNE'S Transformers, used by many well-known set manufacturers after testing all others.

HOYNE'S Transformers, fitted with tapped and screened primaries, filaments all centre tapped, stout cast aluminium clamps and clearly marked terminal strips are fitted to all models.

HOYNE'S Components are Guaranteed for One Year; built to your own specification at very competitive prices.

HOYNE'S Components.—The components you will eventually use, start right; a dud cannot pass the Hoyne test.

HOYNE'S A.V.C. Three, 275-0-275v. 60-70 m.a., 4v. 2.5a., 4v. 4a., 12/6, post 1s.; choke, 30 henry 50 m.a., 7/6, post 6d.

HOYNE'S New Monodial Transformer, 425-0-425v. 120 m.a., 4v. 3a., 4v. 1a., 4v. 1a., 4v. 6a., 24/-, post 1/3; weight 10lb.; 10 henry choke, 6/-, post 6d.; 20 henry choke, 7/6, post 6d.

HOYNE'S.—250-0-250v. 60 m.a., 4v. 1-2a., 4v. 2-4a., 10/-, post 9d.; with extra 4v. 1-2a. winding, 12/6, post 1/-.

HOYNE'S Ferrocart Model.—350-0-350v. 60-70 m.a., 4v. 2-3a., 4v. 2-4a., 12/6, post 1/-; with extra 4v. 1-2a. winding, 13/6, post 1/-.

HOYNE'S.—350-0-350v. 120 m.a., 4v. 2-3a., 4v. 4-6a., 4v. 1a., 4v. 1a., 16/-, post 1/3.

HOYNE'S.—500-450-0-450-500v. 140 m.a., 4v. 2-4a., 4v. 4-6a., 4v. 2a., 4v. 2a., 27/6, post 1/3; weight 11lb.

HOYNE'S.—0-110-135v. 90 m.a., suitable for H.T. 6 or 7, 7/6, post 9d.; with 4v. 2-4a winding, 9/6, post 9d.

HOYNE'S.—200v. 200 m.a., 4v. 2-4a., 4v. 1-2a., for H.T. 8, 13/6, post 1/-.

HOYNE'S.—Auto Transformers, Chokes and Filament Transformers always in stock.

HOYNE'S Components Still Have No Equal.

M. J. HOYNE, Offices and Works, 8a, Gladstone Rd., Wimbledon, S.W.19. Tel.: Liberty 3303. [3730

TRANSFORMER Materials, stampings, wire, etc., cheap; lists free.—Wales, 14, Monmouth Av., Bury. [3872

TANTALUM for A.C. Chargers, H.T. and L.T.—Blackwell's Metallurgical Works, Ltd., Garston, Liverpool. [3448

A.C. Battery Charger, 30-volt output, £3/12/6; another 100 output.—Write Jersey, Cumnor Hill, Oxford. [3888

SERADEX Products, specified for "The Wireless World" Monodial, D.C. Superhet., Modern Battery Four, etc.

SERADEX Mains Equipment, new catalogue now ready, free for stamp.

SERADEX Filter Chokes.—Type C256, constant inductance, 25 h. at 60 m.a., 370 ohms, 12/6; C251, 25 h. at 120 m.a., 260 ohms, 15/-; C252, 25 h. at 150 m.a., 160 ohms, 16/6.

SERADEX Type B Filter Condensers, 1.0 mfd., 1/6; 2.0 mfd., 2/3; 4 mfd., 4/5; 4×4 mfd., 7/3; 8×8 mfd., 14/6.

SERADEX Maiss Transformers, super type, with engraved terminal strips, stripped type, with colour coded leads, screened primaries, 200-230-250 volts.

W.H.5, for H.T. 11, 300v. 550 m.a., 4v. 2½a., 4v. 2½a., 4v. 2½a., 4v. 3-5a., C.T.d. 45/-; W.H.5s, as above, stripped type, 37/6.

OUR Full Range of Catalogues is Available for Stamp, including rectifiers, eliminators, battery chargers, resistances, condensers, mains equipment, etc.

TREVOR PEPPER, 575, Moseley Rd., Birmingham 12 [3764

"DULCI" Unused D.C. Eliminators, 25 milliamps output, 13/- each; post paid, cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. [3850

A.C. or D.C. Chargers for 2 to 200 Cells at Low Prices; state requirements; dynamos and rotaries in stock, all sizes; Brown's Generators, battery superseders for H.T. for 2v. or 6v. input, 37/6 and 52/6; television and sewing machine universal motors, 25/-; lists.—Electradix Radios, 218, Upper Thames St., E.C.4. [0398

ELIMINATOR Kits, comprising Westinghouse rectifier, Williams guaranteed transformer and 2 T.C.C. condensers (voltage doubler), 330 volts 50 m.a., 4-volt 4-amp. C.T., 29/-; 350-volt 60 m.a., 4-volt 5 amp. C.T., 32/-; metallised resistances, all values, 1-watt, 6/- dozen, 2-watt, 1/3 each.—Williams, 233b, All Souls Av., Willesden, N.W.10. [3907

SECRETS OF

CELESTION

SUPREMACY

No. 2

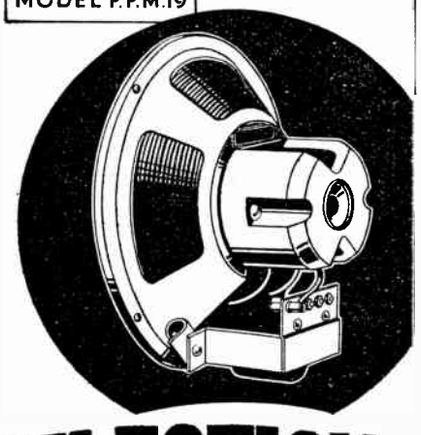
Accurately Proportioned Magnets!

The cobalt steel magnets fitted to Celestion Speakers are *accurately* proportioned. The proportions are such that wasteful magnetic leakage is reduced to a minimum and the whole of the cobalt steel used to its fullest advantage. As a result, Celestion Speakers are much more efficient—are much more sensitive—than other speakers fitted with far larger magnets less accurately designed. It is such *attention to detail* that puts Celestion in the forefront of modern loudspeaker design. The name Celestion stands for high-quality reproduction combined with unfailing efficiency. Celestion speakers can be supplied to match any set or type or output. Ask your dealer to demonstrate, or write for illustrated details.

PPM9	Chassis Model	£1-15-0
PPM19	Chassis Model	£2- 7-6
PPM29	Chassis Model	£3-17-6

Celestion Ltd., London Road, Kingston-on-Thames.

MODEL P.P.M.19



CELESTION

The Very Soul of Music

THE FOREMOST NAME IN SOUND REPRODUCTION

CABINETS.

TABLE Model Cabinets in Walnut; 8/6 each.—Radio Furniture, 106, Victoria St., S.W.1. [3858

RADIO-GRAM Cabinets; fully illustrated list free; remarkable values.—Gilbert, Cabinet Maker, Swindon. [1686

CONSOLE Cabinets, in walnut; new price £3/10, clearing at 25/-.—Radio Furniture, 106, Victoria St., S.W.1. [3857

EPTON Leads Again!—Handsome walnut cabinets, complete with speaker frets, Alba (18×14½×10½), 14/-; Atlas (16½×12½×9), 11/9; Philco type (15×12½×7½), undrilled, 10/6.—Epton, 93, New Rd., Chingford, E.4. [3904

MANUFACTURER'S Clearance Lines of Cabinets for Radiograms, loud-speakers, and radio sets; hundreds to select from; send us particulars of your requirements, giving size of set, etc.—H. L. Smith and Co., Ltd., 289, Edgware Rd., London, W.2. [3832

DYNAMOS, ETC.

TWO 180-watt Converters, 230v. D.C input, 230v. A.C. output, complete with silence cabinets; £6 each.—Radio Furniture, 106, Victoria St., S.W.1. [3859

D.C. Converter, D.C. to A.C., 230 volt, soundproof, last year's, as new; accept £8/10 immediate sale.—Myers, Ovington House, Ovington Sq. Kensington 4065. [3873

ROTARY Converters, 220 volts D.C. to 200 Volts A.C., capacities up to 0.44 K.V.A., from £4/10.—Milo Engineering Works, Milo Rd., East Dulwich, S.E.22. 'Phone: Sydenham 4422. [3891

GRAMOPHONES, PICK-UPS, ETC.

B.T.H. Senior Universal Gramophone Motor; 40/-.—Haigh, 50, Algernon St., Grimsby. [3894

D.C. Motor, 200v., 1,425 r.p.m., 1-20th h.p.; ditto, ditto, 1-16th h.p.—Radio Furniture, 106, Victoria St., S.W.1. [3860

COLLARO Double Spring Motor, B.T.H. Senior pick-up ready mounted; best offer accepted.—L. Gibson, Leeming Bar, Yorks. [3862

LOUD-SPEAKERS.

W.B. Microlode Speaker, P.M. 4A, new; 32/-.—Hutton, Scott Terrace, Hamilton. [3874

MAGNAVOX Moving Coil Loud-speaker, D.C.143, 7,500 ohms, 3-ratio transformer, 10in. diaphragm; £1/10.—Box 8304, c/o *The Wireless World*. [3787

SHOP Soiled Magnavox Speakers, type D.7, 2,500-ohm field, with input transformer; bargain, 25/- each.—Radio Furniture, 106, Victoria St., S.W.1. [3861

30/-!!!—B.T.H R.K. moving coil speakers, 6in. cone, new and unused, guaranteed; these speakers are the type as used in cinema sound equipment; suitable for public address work; weight 30lb., and vastly superior to the cheap speakers now on the market, 100 volts, 150 volts, and 200 volts D.C.

27/6!!!—6-volt D.C. speakers, as above; £2/7/6 speaker as above for 100-250 volts A.C., complete with field rectifier.

B.T.H. Transformer, brand new, ratios 1-1, 2-1, 20-1, and 30-1 microphone; 7/- each.

CARRIAGE Paid, cash with order, or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3771

H.D. Radio Electrical Service Offers Surplus of a Set Manufacturer, every article guaranteed new, moving coil speakers, Magnavox type D.C.144, 2,500 ohms or 7,500 ohms complete with transformer at 18/-; type D.C.142, same voltages, at 25/-; all fitted Humbuckers; all goods carriage paid; cash with order or c.o.d.—No. 9, Kingly St., London, W.1. Regent 6240. [3880

VALVES.

EPTON Leads Again!—Lissen P625a, 4/3; all types American valves.—Epton, 93, New Rd., Chingford, E.4. [3905

THE M.R.D. Co.'s Own New British Valves, guaranteed 6 months, carriage paid; we invite tests against any other make.

2-VOLT Range.—V.M./S.G., S.G.2, 7/6; L.F.2, H.F.2, H.L.2, R.C.2, 3/6; driver, 4/-; P2, 4/6; Pen. 2, 10/-; class B, 1½ watts, 9/-; 3 watts, 9/-; also A.C. range; any details and characteristics on request.—Mains Radio Development Co., 4-6, Muswell Hill Rd., London, N.6. [3839

8/9—Ostar Ganz valves, any type; buy a spare set while our stocks last, state type and voltage required; c.o.d., postage paid.—Kay, 167, City Rd., London, E.C.1. [3814

ALL Latest Types of Brand New American Valves, first class makes: 247s, 235s, 224s, 236s, 237s, 233s, 245s, 244s, 12/-; 227s, 226s, 280s, 245s, 9/6; 242s, 232s, 11/-; U.X.210s, 15/-; U.X.250s, 7 watts output, 16/-; 281s, 14/6; post paid, cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3772

NEWMAN, the Valve Man!—Just arrived, 2,000 brand new latest type American valves, all boxed, guaranteed R.C.A. manufacture; 235 11/-, 224 12/-, 236 13/-, 247 13/6, 237 13/-, 233 15/3, 245 8/-, 244, 14/-, 227 8/-, 226 6/-, 280 8/-, 242 14/-, 232 13/6, 6A7 16/-, etc., etc.; send us your enquiries, prompt attention for cash or c.o.d.—Newmans, 309, Roman Rd., Bow, E.3. [3882

SPECIAL Offer.—Valves by world-famous Continental manufacturers, fully guaranteed, screen grid, variable mu screen grid, high magnification screen grid, low magnification screen grid, H, HL, L, RC; all the above standard mains type, 4/6 each; Philips 328 valves, 5/6; 329 lamps, 2/-; the following 4 volt battery valves at 2/- each, H, HL, L, power.—Premier Supply Stores, 20-22, High St., Clapham, S.W.4. Macaulay 2188. [3911

"The Wireless World" Diary for 1934 Price 1/6 By Post 1/7

MORE ABOUT THE LOUDOSCOPE

The HARTLEY-TURNER loud speaker was designed to eliminate, as far as possible, resonances and other defects of performance which would impair reproduction. We found that certain materials used in a certain way gave certain results; those results are the HARTLEY-TURNER. If we used the same materials in any other way, or other materials in any way at all, results were inferior by actual test. We had no prejudices, nor did cost affect the question at all; we just wanted the best possible speaker.

Regarding the Loudoscope . . . . . .Well it isn't our fault that they look different AND sound different.

HARTLEY-TURNER

the Analytic loud speaker.

D.C. MODEL **7 Gns.** **A.C. MODEL** **8 Gns.**

"New Notes in Radio," sent for 1½d. stamp, will tell you all sorts of interesting things.

1250 ohms field coils now in stock for "The Wireless World" new Monodial Super.

HARTLEY TURNER RADIO LTD.,
THORNBURY ROAD, ISLEWORTH, MIDDLESEX.
Telephone: Hounslow 1854.

I'M THE LAST WORD OF THE OHMICANS

I'm Mr. Ohms himself, chief of the new tribe of Reliable Ohms. I stand for the stability of Erie Resistors. Accuracy, Consistency, Efficiency, are my watchwords. ERIES are the last word of the OHMICANS.

Fit your set or refit it with ERIES. Made of solid carbon and specially impregnated so that they will never crackle or break down. ERIES ARE SAFE.

ERIE 1/- PER WATT IN ALL VALUES

IMPREGNATED **RESISTORS**

WRITE FOR NEW COLOUR CODE CHART, FREE!
Radio Resistor Co., 1, Golden Square, Piccadilly, London, W.1

COMPONENTS, ETC., FOR SALE.

R.

SELECTED Parts for Sale, as new, any c.o.d. or "Wireless World" deposit system, which we recommend if in doubt as to the splendid value offered; we take risk of damage in transit to customers; goods tested for caliers and guaranteed.

RYALL'S Mains Transformers, 250v. 60 m.a., 4v. 1 amp., 4v. 3 amp., 10/6; 350v., 12/9; H.T.7/12/13 with 4v. 4 amp., 10/6, H.T.8, 12/9; 4v. 3-5 amp., 8/9; 4v. 3 amp., 6/9; chokes, 20H. at 100 m.a., 8/9; 15H. at 60 m.a., 6/9; resistance 230 ohms, 25H. at 60 m.a., 6/9; resistance 430 ohms, 40H. at 100 m.a., resistance 600 ohms, 10/6.

WE Hold a Large Stock of First Class Radio Apparatus, meters resistances, heavy chokes, in addition to the goods advertised

SPECIAL Offer of 3v. and Rectifier (valve) Chassis, from Yagerphone, all guaranteed, new and very well made; chassis only 50/-; with valves, 90/-; carriage forward.

B.T.H. Junior A.C. Speaker corrugated cone, with separate rectifier, complete, 65/-; Epoch 99½ 6v. speaker, 45/-; complete A.C. equipment for same, 37/6; Celestion P.M.29, new, 45/-; B.T.H. Senior P.M., late model, with transformer, £3; B.T.H., 200-250v. D.C., with transformer, 18/6; B.T.H. Junior P.M., in cabinet, complete, 30/-.

LAMPLUGH Senior D.C. Speakers 8½in. cone, 2,200 ohms, 13/6; Magnavox D.C.144 speakers, 18/6; Collaro A.C. motor, with pick-up, complete unit, 52/6; Garrard D/S motor, on unit plate, 21/-.

PHILLIPS 6 amp. Charger, complete, 60/-; P.A. set with radio, 10w. A.C. output, entirely complete, modern, £20; Ferranti portable meter, 200 ohms per volt, 250v., 10v. 100 m.a., 45/-, Westinghouse H.T.1, with Foster transformer, 25/-; Ferranti S.4V, transformer, 10/-; Vortexion 250v. 120 m.a., 4v. 2 amp., 4v. 7 amp., 6v., 15/-.

T.C.C. 2 m.f., 350v. Working, 1/6; T.C.C. 1 m.f., 350v. working, type 84, 1/3; T.C.C. 0.01, mica, type M., 1/-; T.C.C. 4×4 m.f., 4/-; H.M.V. 4×4 m.f., 3/6; T.C.C. 4×4×1×1×½ m.f., 4/9; H.M.V. ditto, 4/-; all 250v. working; Triotton, 8 m.f. 450v. working, 3/6, electrolytic; T.C.C. 2,000 m.f. electrolytic, 12v. working, 8/6; T.C.C. 250 m.f. 100v. working, 8/6; T.C.C. 500 m.f. 40v. working, 8/6, post 9d. on all blocks; T.C.C. 15 m.f. electrolytic, 100v. working, new, 1/3.

POLAR Star Senior 3-gang Condensers, new, 15/-, with drive 16/6; Radiophone 3-gangs, complete with cover, drive, etc., new, 15/9; Radiophone 4-gangs, 12/6, with cover, drive and all fittings, 17/6; Radiophone 4-gang super het. type, fully screened with trimmers, Radiopack type, 9/-, post 9d.; Lotus fully screened 4-gangs, new, trimmers on top, 15/-.

SUITCASE Type Cases, in best crocodile leather, 14×14 × 8, ample room for 12in. turntable and pick-up, 10/-; set cabinets for 3v A.C. sets, room for speaker, good appearance, 10/-.

B.T.H. Universal Senior Gramophone Motors, A.C. or D.C., new, complete with auto stop and all fittings; 55/-.

RYALL'S RADIO, 33, Chancery Lane, London, W.C.2 (nearest Tube, Chancery Lane; 'bus 67 passes door, or tram to Savoy St.). Holborn 3529. Open Saturday afternoon. Close 7 p.m., Saturday 6 p.m. Thursday closed 1 o'clock

R. [3875

PREMIER.

PREMIER SUPPLY STORES Offer the following Set Manufacturers' Surplus New Goods at a fraction of the Original Cost, all goods guaranteed perfect, carriage paid over 5/-, under 5/- postage 6d. extra (Ireland, carriage forward).

ELIMINATOR Kits, including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v. 20 m.a., 20 -; trickle charger 8 - extra; 150v. 30 milliamps, with 4v. 2-4 amps. C.T., L.T. 25/-; trickle charger, 6/6 extra; 250v. 60 milliamps, with 4v. 3-5 amps. C.T., L.T., 30/-; 200v. 100 milliamps, with 4v. 3-5 amps. C.T., L.T., 49/6; 300v. 60 milliamps, with 4v. 3-5 amps. C.T., L.T., 37/6.

T.C.C. Condensers, 750v. working, 2 mf. 3/6, 4 mf. 6/-, 4 mf. 450v. working 4/-, 250v. working 1 mf. 1/3, 2 mf. 1/9, 4 mf. 2/6, 1,500v. working Standoff insulators 0.5 mfd. 1/6, 2 mfd. 6/-, aqueous electrolytic 440v. working, 4 mf. 3/-, 8 mf. 3/6.

ALL the Following Lines 6d. each or 5/- per dozen; 4- and 5-pin chassis mounting valve holders; shielded screen grid or pentode leads 1-watt wire end resistances, any value; 0.1 condensers; on-off switches push-pull; polar ganging devices; 0.02 condensers, 0.5 condensers, 0.01 condensers, 0.2 condensers.

POLAR 3-gang 0.0005 Condensers, split end vanes, totally screened disc drive; 6/11.

AMSCO Triple-gang 0.0005 Condensers, with trimmers, 4/11.

T.C.C. Electrolytic Condensers, 100 volts working, 15 mfd.; 1/3.

PREMIER Chokes, 40 m.a., 25 hys., 4/-; 65 m.a., 30 hys., 6/-; 150 m.a., 30 hys., 10/6.

PYE Chokes 20 or 32 hys., 4/-; Premier multi-ratio output transformers, giving 15 different ratios, 7/6.

HIGH Inductance Chokes, resistance 2,500 ohms, 80 henrys, 60 m.a.; 5/6.

WESTINGHOUSE Metal Rectifiers: 120v. at 20 m.a., 6/6; 180v. at 30 m.a., 8/6; 8v. at ½ amp., 6/6; 6v. at 1 amp., 9/6.

HARLEY Pick-up, complete with arm and volume control; 12/6.

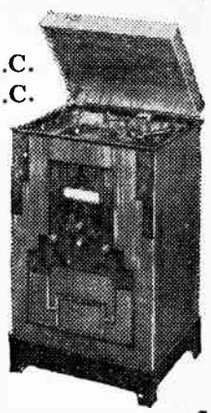
BRITISH RADIOPHONE Wire Wound Potentiometers, with mains switch incorporated, 5,000 ohms, 10,000 ohms, 50,000 ohms, 100,000 ohms, any value; 3/6.

KOLSTER BRANDES Gramophone Motors, dual type, can be worked by clockwork or mains, induction type 100-250 volts, 27/6, complete with all fittings and turntable.

(This advertisement continued on next page.)

THE ONLY all mains BRITISH RADIOGRAM WITH AUTO RECORD CHANGER at the Price

25 GNS. A.C. D.C.



WITH GARRARD AUTO RECORD CHANGER
As Illustrated.

THE:—

H.S.P. RADIOGRAM

Send for Illustrated Lists.

Name .....

Address .....

We are Actual Makers. Handsome Cabinet, Radiogram plays eight tunes, Coil Speaker. Agencies vacant.

H.S.P. WIRELESS CO. LTD.
Langford Works, Weston-Super-Mare.

THIS IS THE 1934 RESISTANCE — THE HYWATT

Note these Points:

The wire element high grade iron free resistance wire (1) which is wound on a specially prepared porcelain former (2), the ends of the resistance being spot welded (3) to copper connecting leads (4), and the whole resistance coated in "Vita" enamel (5).

This is the most advanced resistance yet put on the market and is already extensively used by leading set makers.

Made in all values from 1-50,000 ohms

For full details please write to:—

WATMEL WIRELESS CO., LTD.,
Imperial Works, High Street, Edgware, London.
Telephone: Edgware 0323.

1/-

Watmel COMPONENTS
GET THE BEST OUT OF ANY SET

C.R.C.93.

Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)

SPECIAL Offer.—Microphones by prominent manufacturer, high sensitivity, uniform response, complete with stand, transformer and battery; listed £3/15, our price 18/6.

PREMIER British Made Meters, moving iron, flush mounting, accurate; 0-15, 0-50, 0-100, 0-250 milliamps., 0-1, 0-5 amps., all at 6/-.

ORMOND Condensers, 2-gang, semi shielded, 2 6; wire wound potentiometers, 15,000 ohms, 1/6.

SPECIAL Offer of Mains Transformers, manufactured by Philips, input 100-115v. or 200-250v., output 150-0-150 volts, 40 m.a., 4v. 1a., and 4v. 3a., 4/6; 200-0-200v., 4v. 1a., 4v. 3a., 4/6.

ALL Premier Guaranteed Mains Transformers have engraved terminal strips with terminal connections, input 20-250 volts, 40-100 cycles, all windings paper interleaved.

PREMIER H.T.8 Transformers, 250v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westingbouse rectifier, 25/-.

PREMIER H.T.9 Transformer, 300v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.

PREMIER H.T.10 Transformer, 200v. 100 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westingbouse rectifier, 26/-.

MAGNAVOX, D.C.144. 2,500 ohms field, with humbucking coil, Pentode transformer, 17/6; complete with A.C. conversion kit, 27/6.

DOUBLE Spring Motors, made by Garrard, play five sides of 10in. record, complete with turntable and all fittings; 17/6.

McMICHAEL 2-screen Grid Pentode Transportable 4, complete; gets many stations; £3; no valves or batteries.

SPECIAL Offer.—Accumulator chargers, input 200-250v. A.C. to charge 2- and 4-volt accumulators at ½ amp.; owing to the high efficiency of the silver oxide rectifier employed charger may be used during broadcast; 9/6 each.

CENTRALAB Potentiometers: 50,000, 250,000 and 500,000 ohms, 2/- each; ditto, wire wound, 200 ohms and 400 ohms, 1/-.

A FEW More Only.—Western Electric 4211E's and 4211D's, 15/-; 4212's, £3; callers only.

DOUBLE Wire, metal screened, flexible, 1/- yd.

WESTERN ELECTRIC Mains Transformers: 500-0-500v. 150 m.a., 4v. 3-5 amps., 4v. 2.5 amps., 4v. 2-3 amps., 4v. 1 amp., C.T., 4v. 1 amp., C.T.

RELIABLE Canned Coils with circuit; accurately matched; dual range; 3/- per coil.

PREMIER L.T. Supply Units, consisting of Premier transformer and Westinghouse rectifier, inputs 200-250 A.C. output, 8v. ½ amp., 11/6; 8v. 1 amp., 14/6; 15v. 1 amp., 19/-; 6v. 2 amp., 27/6; 30v. 1 a., 37/6.

PREMIER Mains Transformer, output 135v. 80 m.a., for voltage doubling, 8/6; 4v. 3-4a., c.t. L.T., 2/- extra; Westinghouse rectifier for above, giving 180v. 30 m.a., 8/6.

PREMIER Mains Transformers, output 250-0-250 volts 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary, 15/-.

PREMIER Mains Transformers, output 350-0-350 volts, 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary; 15/-.

PREMIER Mains Transformers, output 400-0-400 volts, 100 m.a., 4v. 4-5a., 4v. 2-3a., with screened primary; 15/-.

PREMIER Auto Transformers, 100-110/200-250 volts or vice versa, 60-watt. 7/9; 100-watt, 10/-.

SPECIAL Offer of Manufacturers' Type Transformers, any input, output 250-0-250 volts, 60 m.a., 4v. 1a., 4v. 3a. (both c.t.), 8/6; H.T.8 transformer, with 4v. 3-4a. (c.t.), 8/6; with rectifier, 18/6.

FILAMENT Transformers, polished and engraved terminal boards, N.P. terminals, 4v. 3-4a., 5/-; 10v. 3a., 6/6; 12v. 1a., 5/-; 4v. 4-6a., 6/6; 14v. 4a., 6/6; 22v. 1a., 6/-; 6v. 2a., 5/-; 9v. 1a., 5/-.

PREMIER Eliminators, input 200-250 volts, 40-100 cycles, A.C., incorporating Westinghouse metal rectifiers, output 250v. 60 m.a., S.G. and 120v. taps, 42/6; with 4v. 4a., c.t. L.T., 7/6 extra.

PREMIER Eliminators, output 150v. at 30 m.a., S.G., and 100v. taps, with 4v. 3-4a. c.t. L.T., 37/6; or with trickle charger, 42/6.

PREMIER Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps, 27/6; with L.T. trickle charger incorporated, 35/-.

PREMIER D.C. Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps; 15/-.

ACCUMULATOR Chargers, 200-250 volts A.C., all incorporating Westinghouse metal rectifiers; 2, 4, and 6v. at ½ amp., 12/6; 2, 4, and 6v. at 1 amp., 17 6; 12v. 1a., 27/6; 6v. 2a., 35/-; 12v. 1.5a., 30/-; 6v. 3a., 39/6; 30v. 1a., 42/6; 50v. 1a., 62/6.

B.T.H. Induction Type (A.C. only) Electric Gramophone Motors, 100-250 v.; 30/- complete.

AMPLION Moving Coil Speakers, type E.M.644, dual fields 2,500 and 5,000 ohms (100 and 200v.), with output transformer, 12/6; A.C. conversion kit for this speaker, 10/- extra

WESTERN ELECTRIC Condensers, 250v. working, 1 mfd. 6d., 2 mfd. 1/-; 500v. working, 1 mfd. 1/-.

T.C.C. Condensers, 250v. working. 4×4×1 mfd., 3/6; 6×4×2×2×2 mfd., 375v. working. 6/11; 4×4×1, 6/-.

SPECIAL Offer of Wire Wound Resistances.—4 watts, any value up to 10,000 ohms, 1/-; 8 watts, any value up to 15,000 ohms, 1/6; 15 watts, any value up to 50,000 ohms, 2/-; 25 watts, any value up to 50,000 ohms, 2/6; 50 watts, any value up to 50,000 ohms, 3/6.

PREMIER SUPPLY STORES, 20-22, High St., Clapham, S.W.4. Macaulay 2188. Closed 1 o'clock Wednesdays, open to 9 o'clock Saturdays. Nearest Station, Clapham North Underground.

PREMIER. [3912

A Word in Your Ear on Moving Coil Speakers

FACT No. 1.

PEDIGREE

The history of the Moving Coil Speaker is the history of ROLA. Right from its inception ROLA has maintained complete ascendancy in the design and construction of Moving Coil Speakers. And ROLA pedigree counts. To-day the great majority of manufacturers throughout the world use ROLA Speakers. The rise of nearly every successful British manufacturer has been identified with the use of ROLA. That is one reason why you cannot do better than instal ROLA in your set.

The model illustrated above is the ROLA FR6-PM (7¾" cone). Price 39/6 complete with Universal transformer for pentode or power valves, or Class B transformer. In the latter case state Class B valve used when ordering.

EXTENSION SPEAKERS

There is a correct Rola Extension Speaker for practically all British Radio Receivers. Rola speakers are used by nearly all British Radio Manufacturers. As it is highly desirable to have the speech coil impedance of the Extension Speaker similar to that of the speaker in the receiver the necessity for using Rola Extension Speakers is manifest.

THE BRITISH ROLA CO. LTD.,
Minerva Road, PARK ROYAL, N.W.10.
'Phone: Willesden 4322-3-4-5.

ROLA
the World's Finest Reproducers

ROLA SPEAKERS
for better Radio Reception

Components, etc., for Sale.—Contd.

SURPLUS RADIO Offer the Following at Ridiculous Prices:—

WIRE Wound Potential Dividers, 4,500, 3,000, 2,000 ohms, and 15,000, 12,000, 8,000 ohms, both 60 watt; at 1/6 each; postage 3d.

DITTO, 5 watt, 40,000 and 23,000 ohms, 40,000 and 80,000 ohms, 40,000 and 100,000 ohms, 30,000 and 50,000 ohms, 20,000, 20,000 and 20,000 ohms; all at 1/- each; postage 3d.

TWO Resistances on 1 Tube, 4,500 and 500 ohms, 60 watt; at 1/6 each; 3d. postage.

THREE Resistances on 1 Tube, 2,500, 1,000 and 80 ohms, 5 watt; at 1/- each; postage 3d.

SINGLE Resistances, 5 watt, 8,000 and 65,000 ohms; at 6d. each; postage 3d.

14 Mfd. Block Condensers, 2 types, 750v. D.C. test, tapped 4-6-2-1-1 and 3-9-2; at 4/- each; postage 6d.

ONE Mfd. Condensers, 750v. D.C. test, at 8d. each, postage 2d.; 4 mfd. condensers, 750v. D.C. test, at 1/6 each, postage 4d.

DOUBLE Smoothing Chokes, mounted, sound, robust job, 120 m.a., 14-28 henries each, usual price 35/-, our price 6/6 each, 9d. postage; single ditto, 4/6 each.

EACH Article is Tested Before Despatch, and guaranteed first class manufacture.

CASH with Order; all goods despatched same day.—The above from Surplus Radio, 94, High Holborn, W.C.1. [3845

WEST END RADIO STORES for Bankrupt Stock bargains.

"FAY" Home Recording Outfit, complete with diamond Stylus, tracking device, sound box, needles, etc.; 5/6, listed at 31/6.

BLANK Records for Fay Sets (Double-sided), 6in., 2/9 per dozen; 8in., 5/6 per dozen.

"FAY" Microphones, complete with stand, transformer, battery, etc.; 18/9, listed at £3/3.

MAINS Transformers.—Heayberd, 200-250v. input, 350-0-350v. 60 m.a., 4v. 4a. and 4v. 2a., 6/6; M.P.A., 200v. 180 m.a., 4v. 3a. and 4v. 1a, for H.T.8, 4/9

T.C.C. 8.25 mfd. 250v. Working Condenser Banks, tapped, 2/6; C.E.C. bakelite condensers, 700v test, 1 mfd. 1/-, 2 mfd. 1/4, 4 mfd. 2/-.

EDISON BELL Wire Wound Resistances, 30,000 to 100,000 ohms, 9d. each, with holder; Edison Bell R.C. units, 1/6

GENUINE N. and K. Farrand Inductor Speakers (green), 22/6, list price 70/-; Brownie 2-valve A.C. chassis, with metal rectifier, 17/6.

POSTAGE Extra on all Orders; we have a large selection of modern walnut radiogram and wireless cabinets for callers only.—West End Radio Stores, 14, Lisle St., Leicester Sq., W.C.2; and at 382, Coldharbour Lane, Brixton, S.W. [3879

WOBURN RADIO Offer following Set Manufacturers' Clearance Lines:—

AMPLION 0.0005 Mica Condensers, 9d.; 0.0003 differentials, 10d.; Siemens 0.01×0.01 mfd., 3,500v. test, 1/7; 4 mfd., 500v. test, 2/3; Hydra 2 mfd., 500v. test, 1/3; Polymet, Dubilier and T.C.C. fixed condensers, all values, 3/- dozen; Ready Radio Cosmic short wave coils, 2/- each; S.T.500 coils at 6/6 per pair; Ferranti output transformers (list 15/6), ratios 18, 23, 32-1, 4/11; H.F. Binocular chokes, 1/3; H.F. chokes, 10d.; special offer of class B driver and choke, 9/6; 7-pin valve holders, 6d.; Spagetti resistances, 3/- per dozen; Erie resistances, ½-watt, 4/6 dozen, 1-watt 6,6, 2-watt 20,000, 1/-; H.M.V. 4-watt, 50,000 and 100,000, 9d.; Sinclair P.M. speaker, power or pentode, 19/6; Edison R.C.C. units, 1/6; Baker Selhurst "Motor" P.M. speaker, 10in. cone, 21/-; Utah D.C. moving coils, power and pentode, 10/6.

LET Us Quote for Components; we make up Monodials to your own requirements.

WOBURN RADIO Co., 7, Woburn Buildings, W.C.1. Euston 1571. [3900

SOUTHERN RADIO'S Wireless Bargains.—Set manufacturers' guaranteed surplus.

MAINS Transformers.—250-0-250 volts 60 m.a., 4v. 1a., 4v. 2-4a., 11/-; 250-0-250 volts 60 m.a., 4v. 1a., 4v. 2-3a., 4v. 1a., 12/-; 350-0-350 volts 60 m.a., 4v. 2-2½a., 4v. 2-4a., 13/6; 350-0-350 volts 120 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 1a., 16/-; 500-0-500 100 m.a., 4v. 2½a., 4v. 3-5a., 4v. 2a., 19/-; step-up or step-down transformers, 0, 100, 110, 200, 230 and 250 volts, 60 watt output, 12/6; 100 watt output, 14/9.

SMOOTHING Chokes.—20 henrys, 120 m.a., 320 ohms, 8/9; 50 henrys, 60 m.a., 500 ohms, 7/8; 40 henrys, 40 m.a., 700 ohms, 6/6.

ALL-MAINS Transformers and Chokes Guaranteed for 12 Months, specials quoted for and delivery given within 3 days of order.

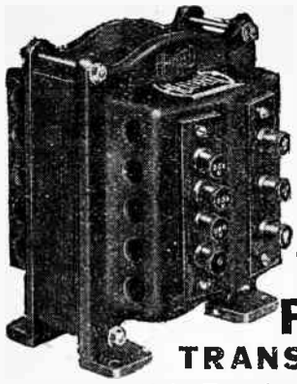
VARIABLE Condensers.—Polar 3-gang 0.0005, complete with dial, knob, escutcheon, 11/- (list 35/-); Lotus 2-gang 0.0005, complete with dial, knob, escutcheon, 8/6; all ganged condensers are fully screened, with trimmers and boxed; Hydra block condensers, new, 16 mfd., 2+2+8+2+1+1, 1,000 volt test, 7/- each; 4 mfd., 2/6; 2 mfd., 1/9; 1 mfd., 1/-; T.C.C. 4 mfd. electrolytic, 440 D.C. working, 3/- each; Hellesens 8 mfd. electrolytic, 3/9 each.

SPEAKERS.—Permanent magnet speakers, 7in. cone, 28/- (listed 49/6); D.C. mains energised, 2,500 to 6,500 ohms, complete with humbucking coils and transformers, 16/6 (list 39/6); G.E.C. Stork speakers, complete in magnificent cabinet, 19/6 (listed £3/15); Ormond speakers, complete in cabinets, 10/- (listed 25/-); Blue Spot, 100U, 13/6 (list 37/6).

CONSTRUCTORS' Kits.—Ready Radio "303" battery 3-valve kits, less valves, 18/- each; complete with 3 Mullard valves (P.M.1L.F., P.M.2, 2D.X.), 33/- each (list 70/-); Ready Radio Meteor screen grid 3-valve kit, less valves, 26/-; with 3 Mullard valves (P.M.12a, P.M.2D.X., P.M.2a), 49/- (list £5/7/6); Universal Radio 3-valve kits, ready assembled on chassis, 12/6 (listed 45/-).

READY RADIO "303" A Kits, complete with cabinet, M.C. speaker, less valves, £2/5; with 3 Mullard valves (P.M.1L.F., P.M.2D.X., P.M.2), £3/5 (list £6/17/6).

(This advertisement continued on next page.)



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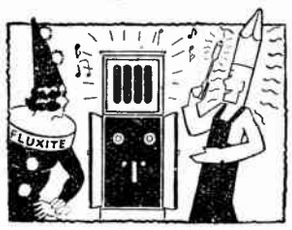

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(This advertisement continued from previous page.)

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READY RADIO S.T.400 Kits, as specified by Scott Taggart, £2/19/6 each (list £4/17/6); Mullard Radio for Million 3-valve A.C. kit, complete with 3 Mullard A.C. valves (Pen.4V, 354V, S4V), £3/10 (list £6/10); Mullard Radio for Million 3-valve battery kits, complete with 3 Mullard valves, £3/3 (list £6/2/6), all kit new, in original sealed cartons.

B.T.H. Senior Pick-ups, 1934 model with volume control, 28/- each (list 37/6); 6 only, Marconi pick-ups, 1934 model No. 19, 25/- (list 32/6); H.M.V. volume controls, 1/6 each (list 12/6).

RECEIVERS.—Burgoyne 3-valve battery transportable sets, complete with valves, batteries, accumulator and speaker; £3/2/6 (list £7/19/6); new, in cartons.

ALL Goods Guaranteed New and Perfect and Sent Carriage Paid.

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SOUTHERN RADIO, 323, Euston Rd., London, N.W.1 (near Warren St. Tube). 'Phone: Museum 6324. [3916

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READY Radio, 0.0005 variables, extenser type (list 10/6), 2/8; Benjamin transfeeda, 8/-.

DUR-AMSCO 0.0005 three-gangs, with trimmers, and drum drive, wave lengths; 7/9; Clix 5-pin chassis v.-holders, 1/6 half dozen.—The Mains Radio Development Co., 4-6, Muswell Hill Rd., London, N.6. [3910

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MILDMAY RADIO EXCHANGE Offers the Following Sets and Components, sound and perfect.

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COLVERN Ganged K61, K62, 2 K.G.O., T.C.C. 0.05 mica, perfect; 22/6.—Swanson, Westbanks Terrace, Wick. [3876

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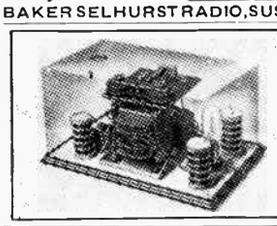

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MODERN circuit design demands the utmost sensitivity from your speaker. Because of the high flux density across the gap of its moving coil the Magnavox P.M. speaker is particularly sensitive and the most suitable to these requirements.

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REWINDS of All Descriptions; mains transformers, chokes rewound or converted, any specification; m/cs., inductors quoted; pick-ups, 3/-; L.F. transformers, 3/-; loudspeakers, 3/-; twelve months' guarantee; 24 hours delivery.—Graham's, 208, High St., Tooting, London. [3834

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GUARANTEED Repairs by Experts, specialists for repairs to S. G. Brown and Amplion radio apparatus also loud speakers, headphones, pick-ups, Blue Spots, any type rewound, remagnetised and adjusted, 4/-; post free; mains transformer repairs; terms to trade.—Howell, 91 Morley Hill, Enfield, Middlesex. [3971

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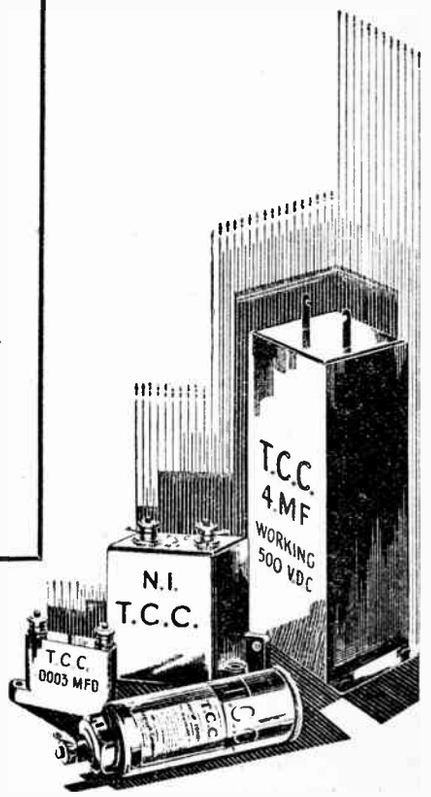

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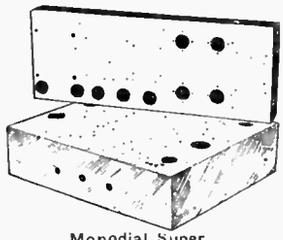

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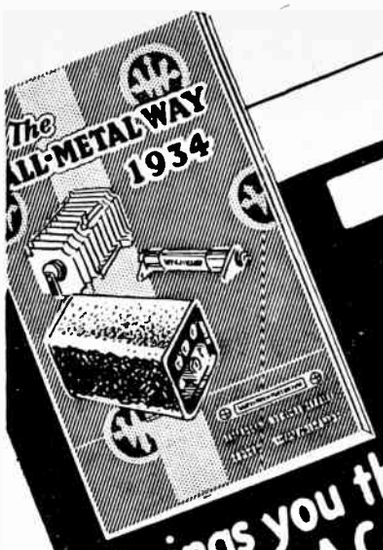

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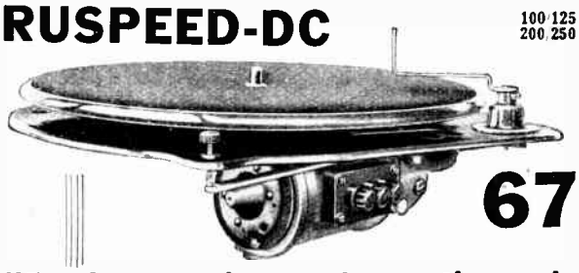

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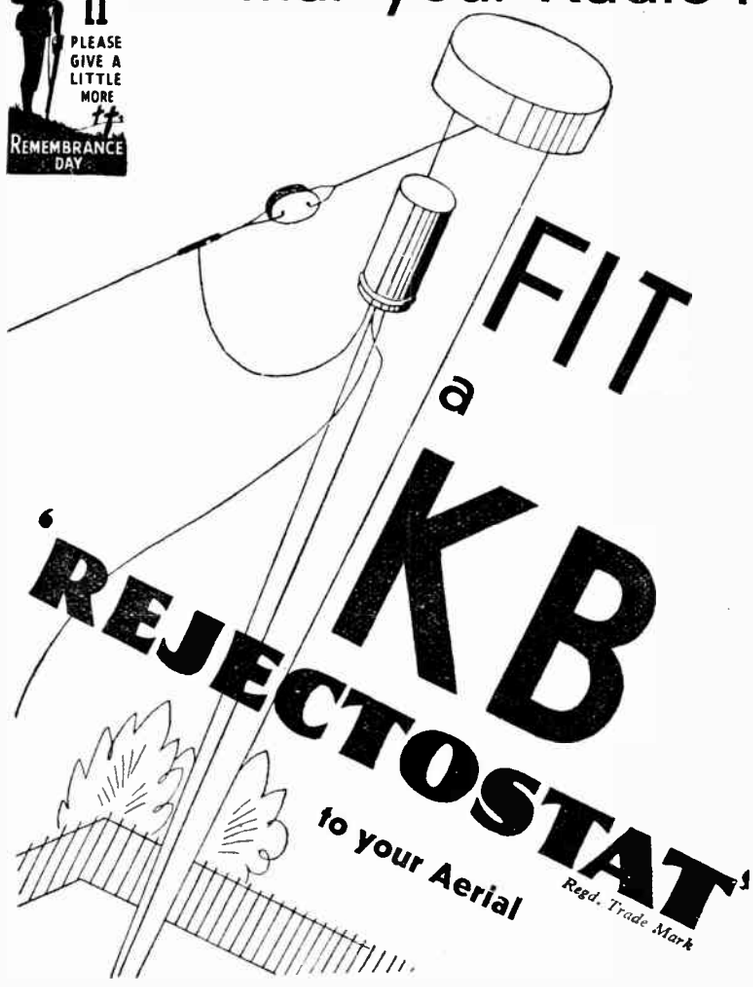

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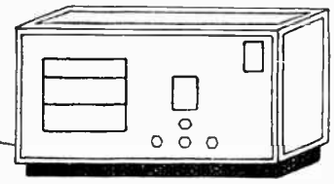

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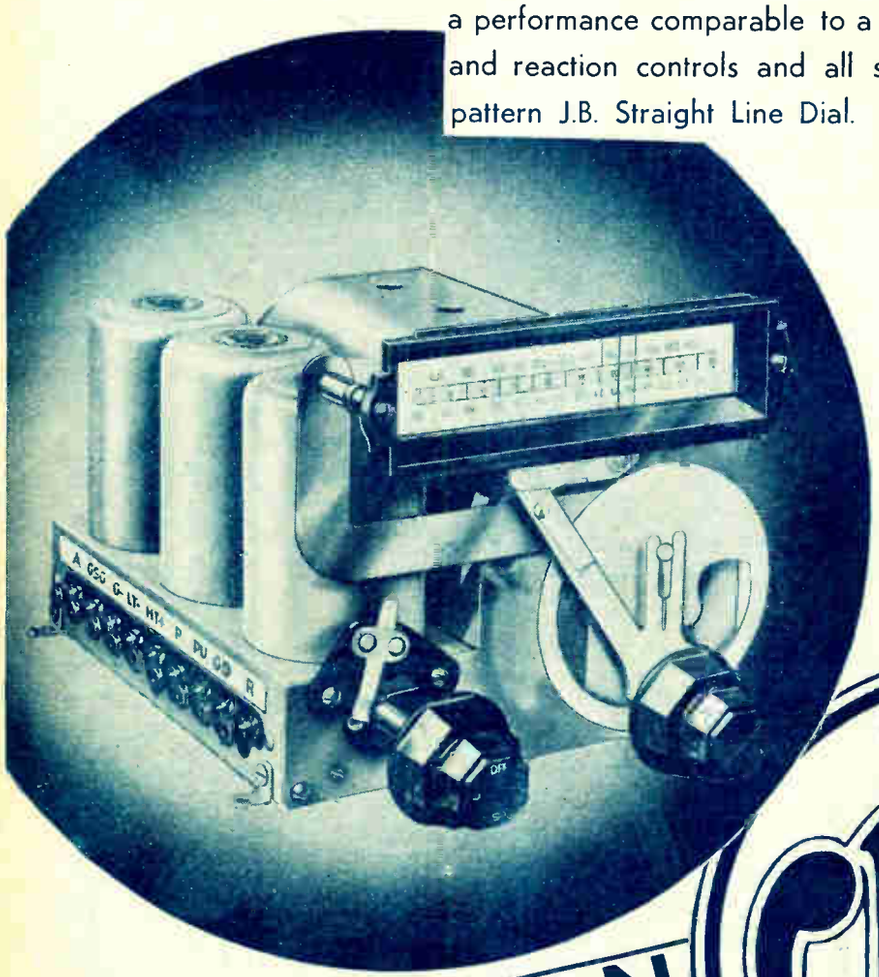

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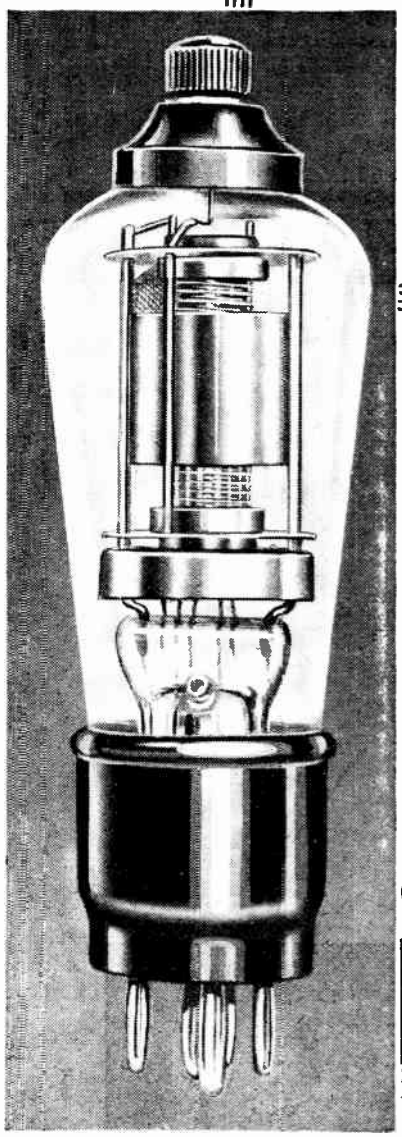

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†*D.V.S./PEN.	Variable Mu H.F. Pentode	2.0	17/6

*Supplied with Plain or Metallised Bulbs. †Characteristics measured at—1.5 Grid Volts

Prices in this List do not apply in I.F.S.

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KINGS OF THE AIR

♡3992

Valve Data

CHARACTERISTICS OF 1933-1934 TYPES

IT cannot be expected that a wireless receiver will function correctly unless suitable types of valve are chosen for use in it. The multiplicity of types now available makes this task one of considerable difficulty if the necessary information concerning the specimens is not conveniently available. As in previous years, therefore, *The Wireless World* Valve Data Booklet provides this information in a compact form for all the chief receiving valves. Owing to the vast number now listed by the makers, it has been found necessary to delete those types which must be considered as obsolete. The guiding principle here has been one which it is believed will commend itself to all users of the booklet—4-volt and 6-volt battery valves have not been listed, nor have other types where later specimens are available with characteristics so similar that they can be used as replacements.

Screen-grid Valves

The screen-grid valve is now rarely used as an H.F. amplifier, having been largely displaced by the variable-mu type, and its chief function lies in the frequency-changer of a superheterodyne. As an amplifier, the grid bias applied is usually about 1.5 volts in mains sets and some 0.9 volt in battery models in order to avoid a flow of grid current which would damp the tuned circuits.

When the valve is used as an amplifier with a 1-1 ratio intervalve coupling, the amplification is readily calculable provided that the dynamic resistance of the tuned circuit is low compared with the internal A.C. resistance of the valve, for it is equal to the product of the mutual conductance and the dynamic resistance divided by 1,000. In cases where a step-up ratio is used, the amplification is calculated as above, but is *divided* also by the ratio.

When the valve is used as a first detector in a superheterodyne, it is usually biased more highly so that its A.C. resistance is increased. The conditions are not easily calculable, but it is convenient to remember that the effective amplification obtainable is usually about one-third of that given by the same valve acting as an amplifier.

As a detector-oscillator the valve must be carefully selected, and it is usually wise to choose a screened H.F. pentode with a high mutual conductance. The H.F. pentode has the advantage over the screen-grid tetrode in not possessing a negative resistance kink in its characteristic, and it is consequently capable of giving a larger undistorted output.

Variable-mu Valves

For amplification purposes variable-mu valves are now almost universal. The stage gain obtainable at minimum and maximum bias is calculated in exactly the same manner as for screen-grid valves, and when operating at minimum bias they function in an identical manner.

The amplification, however, can be varied within wide limits, without introducing distortion or upsetting the tuning, by the simple expedient of varying the grid bias. In a mains set with manual control, the variation of bias is usually obtained with the aid of a potentiometer in the H.T. circuit, to the slider of which the valve cathode is connected. In a battery set, however, a potentiometer must be connected across the bias battery and the grid return lead taken to the slider. Automatic volume control is now rapidly becoming a standard fitting, however, and no manual control of bias is then needed, so that the grid return leads of the variable-mu valves are taken through suitable filters to the A.V.C. bias source, which is usually the detector.

The maximum bias required to effect a given reduction in signal strength becomes a matter of some importance. The smaller the bias required to effect a given change in mutual conductance the better will be the action of A.V.C., or in the case of a battery set with manual volume control, the smaller will be the necessary bias battery. It is unwise to proceed too far in this direction, however, in cases where the set must be used near a local station, for the input handling capacity of low bias valves is usually much less than that of types requiring a large bias, and serious distortion may occur on a strong signal. In this connection it should be pointed out that variable-mu screened H.F. pentodes are a decided improvement over the ordinary types, in that a larger signal handling capacity is obtained.

Multiple Diode Types

The detector stage comes next in order, and here a new section is to be found consisting of those valves which are combinations of diode rectifiers and triode, tetrode, or pentode amplifiers. Their uses are many and varied, and they find their chief application in the provision of automatic volume control. A duo-diode-triode can provide detection, delayed A.V.C., and first stage L.F. amplification, while the single-diode-tetrode is intended chiefly to replace the ordinary screen-grid valve as a detector. Duo-diode-pentodes act in a similar manner to the duo-diode-triodes, except that when the pentode is of the variable-mu type it can be biased for A.V.C. and so increase the range of control.

Triodes

Triodes with internal resistances greater than 7,000 ohms find their chief application as detectors, first-stage L.F. amplifiers, and oscillators for superheterodyne frequency changing purposes. For a grid or power grid detector it is usually best to choose a valve with an internal resistance of some 10,000 ohms, and with a moderately high amplification factor.

In the L.F. amplifier, a similar type of valve is usually best, and with normal designs a resistance of about 10,000 ohms leads to the most even frequency response. In cases where quality is the first consideration, the trend should be towards a valve in the 7,000/10,000 range, while small sets where amplification is at least as important as quality will be best served by the choice of a valve with a resistance between 10,000 ohms and 20,000 ohms. This basis of choice, of course, assumes that the valves have similar values of mutual conductance.

The selection of an oscillator valve is in no way difficult, for almost any valve will function. In general, however, one with an internal resistance of some 10,000 ohms and a mutual conductance of some 1.5/2.5 mA/V. is the best.

Output Triodes

Those valves with resistances less than 7,000 ohms are chiefly of the output type. The few specimens which come into this section and which have resistances above about 4,000 ohms are usually most suitable for acting as low-gain L.F. amplifiers in ultra high quality receivers.

The most important characteristic of an output valve is the power output, for unless this be sufficient it is impossible to obtain good quality reproduction at reasonable volume. For ordinary room strength at good quality some 2,000 milliwatts is necessary, but where the very best quality is desired, and particularly when the high and low frequency responses are unusually well maintained, some 4,000 milliwatts should be allowed. So much depends upon the efficiency of the loud speaker, however, and even upon the characteristics of the room in which it is used, that experience is the best guide for any particular conditions.

The output is calculated upon a basis of 5 per cent. second harmonic distortion, and this involves the statement of the optimum value of load impedance. Since it is unlikely that the speaker will have the correct impedance, a transformer must normally be used for matching, and its ratio can be calculated by dividing the required load impedance by the speaker impedance and taking the square root of the result. In all cases where the speaker impedance is less than the valve load, the transformer will be of the step-down type.

Output Pentodes

The chief advantages of the pentode over the triode are its increased efficiency and sensitivity—a greater output is obtainable for a given expenditure of energy from the H.T. supply, and a smaller signal input is required. To counterbalance this, however, the valve is much more critical in the matching to the loud speaker, and if undue accentuation of the high notes is to be avoided a tone-correction circuit is necessary. Although high-quality reproduction can be obtained with a pentode it is more difficult than with a triode, and the latter is usually selected where quality is of prime importance. The pentode, however, is invaluable in the smaller class of receiver where sensitivity and cost are at least as important as quality.

In the case of receivers intended for operation from D.C. mains, the fact that a pentode requires a much smaller grid bias than a triode is of great importance. It is this which accounts for the rarity of triode output valves suitable for D.C. mains working.

It will be noted that columns are included for the self-bias resistance in both triode and pentode output valve sections. The watts rating of the resistance can be found by multiplying the resistance by the sum of the screen and anode currents and dividing the result by 1,000.

Class "B" Valves

Recent development in battery valves has resulted in the production of a new range of output types combining large output with extreme economy of power drawn from the H.T. battery. The Class "B" valve is really two triodes mounted in the same bulb and operated in push-pull. It is worked with zero or only a small negative bias, and grid current flows during a large portion of the cycle of input voltage.

As regards the output circuit, matching to the loud speaker is obtained with a transformer, the ratio of which must be calculated in the same manner as for other output valves. It is, however, important that the component used should be of suitable type with a low D.C. resistance and a small value of leakage inductance. Since the characteristics of Class "B" valves are similar to those of pentodes, it will usually be found that a resistance-capacity tone-correction circuit across the primary of the output transformer is needed to avoid undue stressing of the upper register.

Because of the grid current flow, the Class "B" valve has a low input impedance, and it is usually necessary to feed it from the preceding L.F., or driver, valve through a step-down transformer. The ratio can be calculated by dividing the load required by the driver valve by the grid-to-grid input impedance of the Class "B" valve and taking the square root of the result.

In a few cases it will be found that this leads to a step-up ratio instead of the usual step-down, and it should be noted that the figures for transformer ratio in the columns are arranged to show this automatically. In every case the first figure refers to the primary; thus, 2-1 ratio means that the primary has twice as many turns as the secondary and that the transformer is of the step-down type. A ratio of 1-2, however, means that the primary has one-half the secondary turns and the transformer is of the step-up type.

Class "B" working is primarily intended for the battery user, and it does not go happily with mains operation as far as the smaller class of valve is concerned. One or two types for mains operation are making their appearance, however, and they are intended chiefly for cases where a very large output is required, such as public address equipment.

Rectifying Valves

Little need be said about the rectifier for the H.T. supply in an A.C. receiver, since the questions arising are by now well known. It may be remarked, however, that indirectly heated cathode types are making their appearance among the specimens rated for the higher voltages and that they are well worth consideration. By their use it is possible to avoid the necessity for

(*Concluded on page 22.*)

SCREEN-GRID VALVES

Type.		Filament.		Max. Anode Volts.	Optimum Screen Volts.	Average Anode Current (mA.).	Screen Current (mA.).	A.C. Resistance (Ohms).	Mutual Conductance (mA/V.).	Pins in Base.	Price.
		Volts.	Amps.								
Clarion	SG 2	2.0	0.11	150	80	2.5	0.75	300,000	1.0	4	12/6†
	AC SG	4.0*	1.0	200	85	3.0	1.0	350,000	1.4	5	14/–†
Cossor	215 SG	2.0	0.15	150	80	0.7	—	300,600	1.1	4	15/6†
	220 SG	2.0	0.2	150	80	0.7	—	200,000	1.6	4	15/6†
	MSG HA	4.0*	1.0	200	80	2.1	—	500,000	2.0	5	17/6†
	41 MSG	4.0*	1.0	200	80	0.8	—	400,000	2.5	5	17/6†
	MSG LA	4.0*	1.0	200	80	5.2	—	200,000	3.75	5	17/6†
	MS Pen (P)	4.0*	1.0	200	100	4.7	1.3	—	2.8	5 and 7	17/6†
	MS Pen A (P)	4.0*	1.0	200	150	9.0	5.0	—	4.0	5	17/6 (M)
	DS Pen (P)	16.0*	0.25	200	100	4.7	1.7	—	2.3	5	17/6†
Dario	TB 422	2.0	0.15	150	100	2.0	—	200,000	1.0	4	12/6
	TE 424	4.0*	1.0	200	100	1.5	—	600,000	1.1	5	13/6†
	TE 524T	4.0*	1.0	200	100	3.0	—	300,000	3.0	5	13/6†
	D.C. Screenodion	20.0*	0.18	200	60	4.0	—	360,000	1.1	5	15/– (M)
Eta	BY 6	2.0	0.15	150	80	2.5	—	300,000	1.1	4	12/6 (M)
	DW 6	4.0*	1.0	200	75	0.75	1.0	800,000	1.2	5	15/6 (M)
	DW 7	4.0*	1.0	200	80	5.0	2.0	200,000	3.0	5	15/6 (M)
Ferranti	SPT 4 (P)	4.0*	1.0	200	100	5.5	2.0	1,000,000	2.6	5	17/6
Hivac	SG 210	2.0	0.1	150	80	2.0	1.25	250,000	1.0	4	10/6
Lissen	SG 215	2.0	0.15	150	60	1.5	0.25	900,000	1.1	4	12/6
	AC/SG	4.0*	1.0	200	80	7.0	0.5	340,000	4.0	5	17/6
Marconi and Osram.	S 21	2.0	0.1	150	70	2.0	1.5	200,000	1.1	4	15/6†
	S 22	2.0	0.2	150	75	1.5	1.6	200,000	1.75	4	15/6†
	S 23	2.0	0.1	150	70	1.4	0.8	250,000	1.1	4	15/6†
	S 24	2.0	0.15	150	70	1.4	1.0	250,000	1.4	4	15/6†
	MS 4	4.0*	1.0	200	60	2.4	0.3	500,000	1.1	5	17/6†
	MS 4 B (Catkin)	4.0*	1.0	200	80	3.4	1.2	350,000	3.2	5	17/6†
	MSP 4 (P)	4.0*	1.0	200	100	3.0	1.0	750,000	4.0	7	17/6 (M)
	DS	16.0*	0.25	200	70	2.4	0.3	500,000	1.1	5	17/6†
	DSB	16.0*	0.25	200	80	3.4	1.2	350,000	3.2	5	17/6†
Mazda	SG 215	2.0	0.15	150	60	1.5	0.25	455,000	1.1	4	15/6
	S 215A	2.0	0.15	150	60	1.9	0.3	720,000	1.1	4	15/6 (M)
	S 215B	2.0	0.15	150	80	1.5	0.3	410,000	1.7	4	15/6 (M)
	AC SG	4.0*	1.0	200	60	4.5	0.8	895,000	1.9	5	17/6†
	AC S 2	4.0*	1.0	200	80	7.0	1.2	600,000	4.4	5	17/6†
	AC S 2 Pen (P)	4.0*	1.0	250	100	6.5	2.2	1,500,000	5.5	7	17/6 (M)
	DC SG	6.0*	0.5	200	60	3.5	0.7	810,000	1.8	5	17/6†
	DC 2 SG	20.0*	0.1	200	80	7.3	1.5	510,000	1.8	5	17/6 (M)
Micromesh	5B.1	2.0	0.18	150	75	0.5	0.15	400,000	1.25	4	15/6
	S.G.A.1	4.0*	1.0	200	100	6.0	1.5	500,000	3.0	5	17/6
	8A.1 (P)	4.0*	1.0	250	100	3.5	1.9	375,000	4.0	5	17/6
Mullard	PM 12 A	2.0	0.18	150	90	3.0	0.5	330,000	1.5	4	15/6†
	PM 12	2.0	0.15	150	75	4.5	1.0	180,000	1.1	4	15/6†
	S 4 VA	4.0*	1.0	200	110	2.5	0.6	500,000	2.0	5	17/6†
	S 4 VB	4.0*	1.0	200	110	4.5	0.9	300,000	2.5	5	17/6†
	SP 4 (P)	4.0*	1.0	200	100	4.5	1.5	900,000	3.0	5	17/6†
	SG 20	20.0*	0.18	200	100	3.75	0.5	375,000	2.0	5	17/6 (M)
	SP 20 (P)	20.0*	0.18	200	100	4.5	1.5	—	3.5	5	17/6†
Ostar-Ganz	S 25	250 max.*	0.024	300	100	7.0	—	250,000	3.8	5 and 7	18/9
	S 100	250 max.*	0.024	300	100	1.0	—	1,000,000	4.0	5 and 7	18/9
Pix	25	2.0	0.15	150	75	2.5	0.5	230,000	1.0	4	11/6
	450 AC	4.0*	1.0	200	75	3.5	0.75	200,000	3.0	5	15/6

* Indirectly heated valve. (P) H.F. Pentode. (M) Metallised only. † Plain or metallised.

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R. & A. perfection is the outcome of specialisation in Reproducer design and construction.

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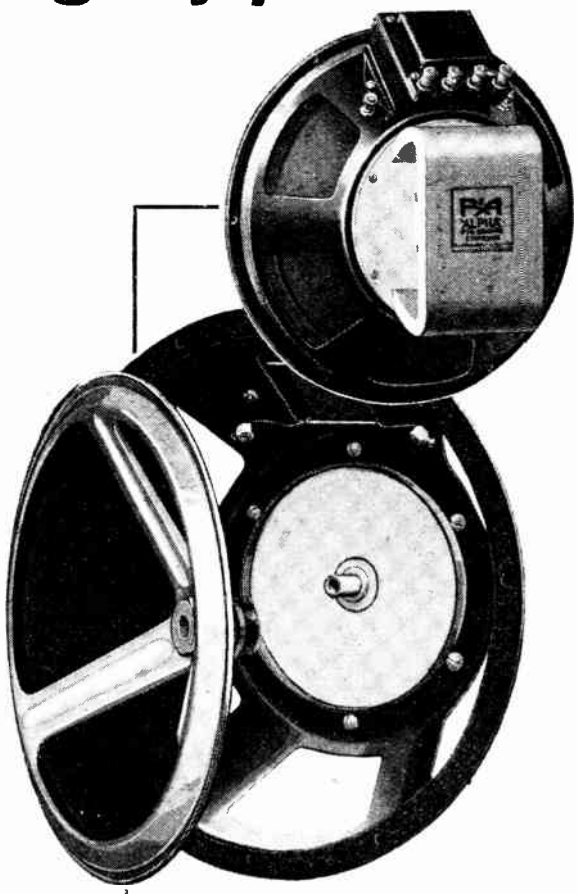

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The unique and patented method of mounting the diaphragm independently of the chassis ensures complete freedom from the effects of chassis distortion.
Diaphragm and speech coil are mounted to a pressed steel member which is secured to the centre pole piece by a single nut. Thus accurate centreing of the speech coil in the gap ensures permanently trouble free operation.

STANDARD MODEL with 6 ratio transformer for Triodes and Pentodes.

MODEL "B" with transformer correctly designed for Class "B" operation.

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52/6

REPRODUCERS & AMPLIFIERS LTD., WOLVERHAMPTON

312

Hold ons

SCREEN-GRID VALVES—(*Continued*)

Type.		Filament. Volts.	Filament. Amps.	Max. Anode Volts.	Optimum Screen Volts.	Average Anode Current (mA.).	Screen Current (mA.).	A.C. Resistance (Ohms).	Mutual Conductance (mA/V.).	Pins in Base.	Price.
Six-Sixty	SS 215 SG	2.0	0.15	150	60	2.5	—	190,000	1.1	4	15/6
	SS 218 SG	2.0	0.18	150	90	2.8	—	330,000	1.5	4	15/6
	SS 4 SG AC	4.0*	1.0	200	75	1.0	—	1,000,000	1.0	5	17/6
	SS 4 XSG AC	4.0*	1.0	200	100	2.5	—	500,000	2.0	5	17/6
	SS 4 YSG AC	4.0*	1.0	200	100	4.5	—	300,000	3.6	5	17/6
	SS HP1 AC (P)	4.0*	1.0	200	100	4.5	—	770,000	3.5	5	17/6
362	SG 2	2.0	0.2	150	75	4.0	1.0	400,000	1.5	4	7/6
	AC SG 4	4.0*	1.0	200	75	4.0	2.0	400,000	2.5	5	12/6
Triotron	S 207	2.0	0.15	200	100	3.5	0.5	180,000	1.0	4	10/6
	S 215	2.0	0.18	150	90	2.75	0.5	333,000	1.5	4	10/6
	S 410 N	4.0*	1.0	200	60	4.0	1.0	400,000	1.0	5	12/6
	S 435 N (P)	4.0*	1.1	200	100	3.0	0.5	1,450,000	3.5	5	12/6
	S 2035 N (P)	20.0*	0.18	200	100	3.0	0.5	1,450,000	3.5	5	12/6
Tungsram	S 210	2.0	0.1	200	100	1.5	0.4	333,000	1.2	4	12/6
	S 220	2.0	0.2	200	100	2.5	0.6	350,000	2.0	4	12/6
	AS 4120	4.0*	1.0	200	100	3.0	0.8	450,000	3.0	5	14/6
	AS 4100	4.0*	1.0	200	100	4.0	1.2	180,000	1.5	5	14/6
	AS 495	4.0*	1.0	200	100	1.0	0.6	428,000	3.5	5	14/6
	AS 494	4.0*	1.0	200	100	1.5	0.8	667,000	1.5	5	14/6
	HP 4100 (P)	4.0*	1.0	200	100	3.0	1.2	2,000,000	3.5	5 and 7	14/6
	HP 2018 (P)	20.0*	0.18	200	100	3.0	1.2	2,000,000	3.5	5 and 7	14/6
	SS 2018	20.0*	0.18	200	100	2.0	1.0	450,000	3.0	5	14/6
	S 2018	20.0*	0.18	200	100	3.0	1.2	333,000	1.2	5	14/6
	HP 1018 (P)	10.0*	0.18	250	150	2.3	—	1,500,000	1.25	—	—

VARIABLE-MU VALVES

Type.		Filament. Volts.	Filament. Amps.	A. Max. Anode Volts.	B. Optimum Screen Volts.	Average Anode Current (mA).	Average Screen Current (mA.).	A.C. Resistance at A, B, and C (Ohms).	Max. Mutual Conductance for A, B & C (mA/V.).	Min. Mutual Conductance for A, B & D (mA/V.).	C. Min. Grid Bias.	D. Max. Grid Bias.	Pins in Base.	Price.
Clarion	VS 2	2.0	0.11	150	80	4.5	1.2	—	1.2	0.1	0	−15	4	12/6†
	AC VS	4.0*	1.0	200	90	7.0	1.5	—	2.0	0.1	−1.5	−36	5	14/-†
Cossor	220 VS	2.0	0.2	150	80	1.6	—	400,000	1.6	0.06	0	− 9	4	15/6†
	220 VSG	2.0	0.2	150	80	2.6	—	110,000	1.6	0.06	0	15	4	15/6†
	MVSG	4.0*	1.0	200	80	7.8	—	200,000	2.5	0.05	−1.5	−35	5	17/6†
	MVS/Pen (P)	4.0*	1.0	200	100	4.2	1.3	—	2.2	0.03	−1.5	−16	5 and 7	17/6†
	DVSG	16.0*	0.25	200	80	7.5	—	200,000	2.5	0.03	−1.5	−35	5	17/6†
	DVS/Pen (P)	16.0*	0.25	200	100	5.0	1.7	—	2.0	0.04	−1.5	−16	5	17/6†
Dario	TB 452	2.0	0.15	150	70	2.0	—	—	1.25	0.05	−0.5	− 9	4	13/6†
	TE 554	4.0*	1.0	200	100	6.0	—	300,000	1.0	0.005	−2.0	−40	5	13/6†
Eta	DW 8	4.0*	1.0	250	100	9.0	3.5	200,000	2.0	0.008	−1.5	−30	5	15/6 (M)
Ferranti	VPT 4 (P)	4.0*	1.0	200	100	5.5	2.0	1,000,000	2.0	0.01	−3.0	−30	5	17/6
Hivac	VS 210	2.0	0.2	150	75	6.0	1.5	110,000	1.0	0.075	0	−14	4	10/6
Lissen	SG 2 V	2.0	0.15	150	80	4.0	0.25	400,000	1.2	0.01	0	−10	4	12/6
	AC/SGV	4.0*	1.0	200	80	6.0	0.5	300,000	4.0	0.01	−1.5	−20	5	17/6
	SGV 16	16.0*	0.25	200	80	6.0	0.5	300,000	4.0	0.01	−1.5	−20	5	17/6

* Indirectly heated. (P) H.F. Pentode. (M) Metallised only. † Plain or metallised.

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ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM.

VARIABLE-MU VALVES—(*Continued*)

Type.		Filament.		A. Max. Anode Volts.	B. Optimum Screen Volts.	Average Anode Current (mA).	Average Screen Current (mA.).	A.C. Resistance at A, B, and C (Ohms).	Max. Mutual Conductance for A, B & C (mA/V.).	Min. Mutual Conductance for A, B & D (mA/V.).	C. Min. Grid Bias.	D. Max. Grid Bias.	Pins in Base.	Price.
		Volts.	Amps.											
Marconi and Osram.	VS 24	2.0	0.15	150	75	4.4	0.3	—	1.5	0.016	0	− 9	4	15/6†
	VP 21 (P)	2.0	0.1	150	75	2.85	0.7	—	1.1	0.008	0	− 9	7	15/6 (M)
	VMS 4 (**Catkin**)	4.0*	1.0	200	80	10.0	2.0	—	2.6	0.03	−1.0	−30	5	17/6†
	VMS 4 B	4.0*	1.0	200	80	5.0	1.0	—	2.9	0.04	−1.0	−15	5	17/6†
	VMP 4 (P)	4.0*	1.0	200	100	6.0	2.0	—	3.5	0.004	−1.0	−30	7	17/6 (M)
	VDS	16.0*	0.25	200	80	10.0	1.0	—	2.4	0.013	−1.0	−30	5	17/6†
	VDSB	16.0*	0.25	200	80	6.0	0.5	—	3.0	0.035	−1.0	−15	5	17/6†
Mazda	S 215 VM	2.0	0.15	150	60	1.0	0.15	500,000	1.4	0.01	0	− 8	4	15/6 (M)
	AC/S 1 VM	4.0*	1.0	200	75	4.5	0.8	545,000	1.1	0.005	1.5	−40	5	17/6 (M)
	AC/SGVM	4.0*	1.0	200	60	5.0	0.9	700,000	2.0	0.005	− 2	−35	5	17/6 (M)
	DC 2/SG VM	20.0*	0.1	200	60	5.0	0.9	—	1.5	0.005	1.5	−30	5	17/6 (M)
Micromesh	VSGA 1	4.0*	1.0	200	100	7.0	1.8	200,000	6.15	0.03	−1.5	−35	5	17/6
	9 A1 (P)	4.0*	1.0	250	100	5.0	2.0	600,000	4.25	0.015	−1.5	−40	5	17/6
Mullard	PM 12 M	2.0	0.18	150	90	2.5	0.4	230,000	1.4	0.014	0	− 9	4	15/6†
	MM 4 V	4.0*	1.0	200	110	4.0	1.0	350,000	2.5	0.01	−1.5	−40	5	17/6 (M)
	VM 4 V	4.0*	1.0	200	100	6.0	1.5	300,000	1.2	0.005	−1.5	−40	5	17/6 (M)
	VP 4 (P)	4.0*	1.0	200	100	5.5	2.0	2,000,000	2.5	0.002	−1.5	−40	5	17/6 (M)
	VP 20 (P)	20.0*	0.18	200	100	4.5	1.5	2,000,000	2.5	0.002	−1.5	−40	5	17/6 (M)
Ostar-Ganz	MS 18	250 max.*	0.024	300	100	5.0	—	500,000	3.0	—	−2.0	−18	5 and 7	18/9
	MS 70	250 max.*	0.024	300	100	4.0	—	500,000	3.0	—	−2.0	−40	5 and 7	18/9
Six-Sixty	SS 215 VSG	2.0	0.15	150	90	3.0	—	—	0.75	—	0	−20	4	15/6
	SS 218 VSG	2.0	0.18	150	90	2.0	—	—	1.4	0.014	0	− 7	4	15/6
	SS 4 MM AC	4.0*	1.0	200	110	5.0	—	—	2.6	0.01	1.5	−40	5	17/6
	SS 4 VM AC	4.0*	1.0	200	100	5.0	—	—	1.2	0.005	1.5	−20	5	17/6
	SS HP2 AC (P)	4.0*	1.0	200	100	6.0	—	—	2.5	0.025	1.5	−20	5	17/6
362	VS 2	2.0	0.2	150	75	3.0	1.0	—	1.2	0.1	0	−25	4	7/6
	AC VS 4	4.0*	1.0	200	75	6.0	2.0	400,000	2.0	0.1	1.5	−40	5	12/6
Triotron	S 208	2.0	0.75	200	100	5.0	0.5	360,000	0.8	0.01	0	−20	4	10/6
	S 415 N	4.0*	1.1	200	100	6.0	1.0	300,000	1.2	0.001	−2.0	−40	5	12/6
	S 434 N (P)	4.0*	1.1	200	100	5.5	0.01	600,000	3.5	0.01	−2.0	−35	5	12/6
	S 2034 N (P)	20.0*	0.18	200	100	5.5	0.01	600,000	3.5	0.01	−2.0	−35	5	12/6
Tungsram	SV 220	2.0	0.2	200	100	3.5	0.6	400,000	1.8	0.03	0	−15	4	12/6
	SE 220	2.0	0.2	200	100	3.0	0.5	333,000	1.2	0.01	0	−15	4	12/6
	AS 4105	4.0*	1.0	200	100	4.0	0.9	650,000	1.2	0.008	−2.0	−30	5	14/6
	HP 4105 (P)	4.0*	1.0	200	100	5.0	1.1	1,000,000	3.5	0.02	−2.0	−35	5 and 7	14/6
	AS 4125	4.0*	1.2	200	100	3.0	0.8	233,000	3.0	0.05	−1.5	−24	5	14/6
	HP 2118 (P)	20.0*	0.18	200	100	5.0	1.1	1,000,000	3.5	0.02	−2.0	−35	5 and 7	14/6
	SE 2118	20.0*	0.18	200	100	4.0	0.9	233,000	3.0	0.05	−1.5	−24	5	14/6
	SE 2018	20.0*	0.18	200	100	4.0	1.1	333,000	1.4	0.03	−2.0	−40	5	14/6
	HP 1118 (P)	10.0*	0.18	250	125	10.5	—	—	1.64	—	—		—	—

MULTIPLE DIODE VALVES

Type.		Description.	Filament.		Max. Anode Volts.	Max. Screen Volts.	Average Anode Current (mA.).	Average Screen Current (mA.).	Grid Bias.	A.C. Resistance (Ohms).	Amplification Factor.	Mutual Conductance (mA/V.).	Pins in Base.	Price.
			Volts.	Amps.										
Cossor	DDT	Duo-diode-triode	4.0*	1.0	200	—	3.4	—	−3.0	17,000	41	2.4	7	15/6
	DD Pen.	Duo-diode-pentode	4.0*	1.0	250	200	7.0	2.0	−1.5	—	—	2.7	7	20/-
	DDT 16	Duo-diode-triode	16.0*	0.25	200	—	4.0	—	−3.5	16,000	40	2.5	7	15/6
Ferranti	H 4 D	Duo-diode-triode	4.0*	1.0	200	—	4.0	—	−3.0	14,500	39	2.7	7	15/6

* Indirectly heated. (P) H.F. Pentode. (M) Metallised only. † Plain or metallised.

MULTIPLE DIODE VALVES—(*Continued*)

Type.		Description.	Filament.		Max. Anode Volts.	Max. Screen Volts.	Average Anode Current (mA.).	Average Screen Current (mA.).	Grid Bias.	A.C. Resistance (Ohms).	Amplification Factor.	Mutual Conductance (mA/V.).	Pins in Base.	Price.
			Volts.	Amps.										
Lissen	L2/D	Diode-triode	2.0	0.1	150	—	2.0	—	−4.5	12,000	18	1.5	5	10/6
	AVC/2	Diode-pentode	2.0	0.15	150	100	2.0	0.5	0	500,000	500	1.0	4	17/6
	AC/AVC	Diode-pentode	4.0*	1.0	200	150	3.0	1.0	0	500,000	1,000	2.0	5	20/–
Marconi and Osram.	MHD 4	Duo-diode-triode	4.0*	1.0	200	—	3.0	—	−3.0	18,200	40	2.2	7	15/6†
	DHD	Duo-diode-triode	16.0*	0.25	200	—	3.2	—	−3.2	18,200	40	2.2	7	15/6†
Mazda	L 2/DD	Duo-diode-triode	2.0	0.1	150	—	3.0	—	−3.5	10,000	16	1.6	5	9/– (M)
	AC/DD	Duo-diode	4.0*	1.0	—	—	—	—	—	—	—	—	5	13/6 (M)
	AC/HL DD	Duo-diode-triode	4.0*	1.0	250	—	4.3	—	−3.0	13,800	36	2.6	7	15/– (M)
Micromesh	H A2	Duo-diode triode	4.0*	1.0	200	—	3.0	—	−2.0	18,000	50	2.8	7	15/6 (M)
Mullard	TDD 4	Duo-diode-triode	4.0*	1.2	200	—	3.5	—	−3.5	15,000	30	2.0	7	15/6 (M)
	SD 4	Single-diode-tetrode	4.0*	1.0	200	100	—	—	−2.2	—	—	3.0	7	20/– (M)
	TDD 25	Duo-diode-triode	25.0*	0.18	200	—	4.0	—	−4.0	15,000	30	2.0	7	15/6 (M)
Ostar-Ganz	BA 1	——	250 max.*	0.024	300	200	2.0	—	−1.0	45,000	90	2.0	7	18/3
	BA 5	——	250 max.*	0.024	300	200	4.0	—	−7.0	10,000	20	2.0	7	18/3
Six-Sixty	SS 4 DDTAC	Duo-diode-triode	4.0*	1.2	200	—	3.5	—	−3.5	15,000	30	2.0	7	15/6
Triotron	B 430 N	Single-diode-tetrode	4.0*	1.0	200	33	0.35	0.25	−2.3	3,333,000	1,000	0.3	7	13/6
	B 2030 N	Single-diode-tetrode	20.0*	0.18	200	30	0.35	0.25	−2.0	3,333,000	1,000	0.3	7	13/6
Tungsram	DS 4100	Single-diode-tetrode	4.0*	1.0	200	90	4.0	1.0	−3.5	2,500,000	2,000	0.7	7	—
	DS 2018	Single-diode-tetrode	20.0*	0.18	200	90	4.0	1.0	−3.5	2,500,000	2,000	0.7	7	—

TRIODE VALVES

(A.C. Resistance greater than 7,000 ohms).

Type.		Filament.		A. Max. Anode Volts.	Average Anode Current for A & B (mA.).	At Zero Grid Volts and 100 v. H.T.			B. Grid Bias for A.	Pins in Base.	Price.
		Volts.	Amps.			A.C. Resistance (Ohms).	Mutual Conductance (mA/V.).	Amplification Factor.			
Clarion	H 2	2.0	0.11	150	2.5	20,000	1.0	20	−1.5	4	5/6†
	HL 2	2.0	0.11	150	4.0	10,000	1.0	10	−4.5	4	5/6†
	AC HF	4.0*	1.0	200	3.0	14,000	2.5	35	−3.0	5	9/6†
Cossor	210 RC	2.0	0.1	150	0.85	50,000	0.8	40	−1.5	4	7/–
	210 HL	2.0	0.1	150	1.6	22,000	1.1	24	−3.0	4	7/–†
	210 HF	2.0	0.1	150	1.6	15,800	1.5	24	−3.0	4	7/–†
	210 DET	2.0	0.1	150	3.0	13,000	1.15	15	−4.5	4	7/–†
	210 LF	2.0	0.1	150	4.8	10,000	1.4	14	−4.5	4	7/–
	41 MRC	4.0*	1.0	200	2.7	19,500	2.6	50	−2.0	5	14/–
	41 MH	4.0*	1.0	200	3.2	18,000	4.0	72	−1.5	5	13/6†
	41 MHP	4.0*	1.0	200	3.0	14,500	2.8	41	−3.0	5	14/–
	41 MHL	4.0*	1.0	200	4.0	11,500	4.5	52	−3.0	5	13/6†
	41 MLF	4.0*	1.0	180	9.0	7,900	1.9	15	−5.5	5	14/–
	DHL	16.0*	0.25	200	5.0	13,000	4.5	58	−2.0	5	13/6†
Dario	TB 122	2.0	0.1	150	4.5	8,000	1.25	10	−7.5	4	5/–
	TB 282	2.0	0.1	150	2.5	20,000	1.6	32	−1.5	4	5/–
	TB 172	2.0	0.15	150	3.5	7,500	2.0	15	−6.0	4	5/–
	TE 384	4.0*	1.0	200	3.0	20,000	2.0	40	−2.0	5	9/6†
	TE 244 N	4.0*	1.0	200	6.0	7,500	3.2	24	−6.0	5	9/6†
	D.C. Super Detector	20.0*	0.18	200	6.0	11,000	3.5	38	−3.0	5	11/6
Eta	BY 1210	2.0	0.11	150	4.0	10,000	2.0	20	−4.5	4	5/6 (M)
	BY 1815	2.0	0.12	150	3.0	14,000	1.3	18	−2.5	4	5/6 (M)
	DW 4023	4.0*	1.0	150	2.5	23,000	1.75	40	−3.0	5	11/– (M)
	DW 4011	4.0*	1.0	200	5.0	11,000	3.6	40	−5.0	5	11/– (M)
	DW 1508	4.0*	1.0	150	4.0	7,500	2.0	15	−7.5	5	11/– (M)

* Indirectly Heated. (M) Metallised only. † Plain or Metallised.

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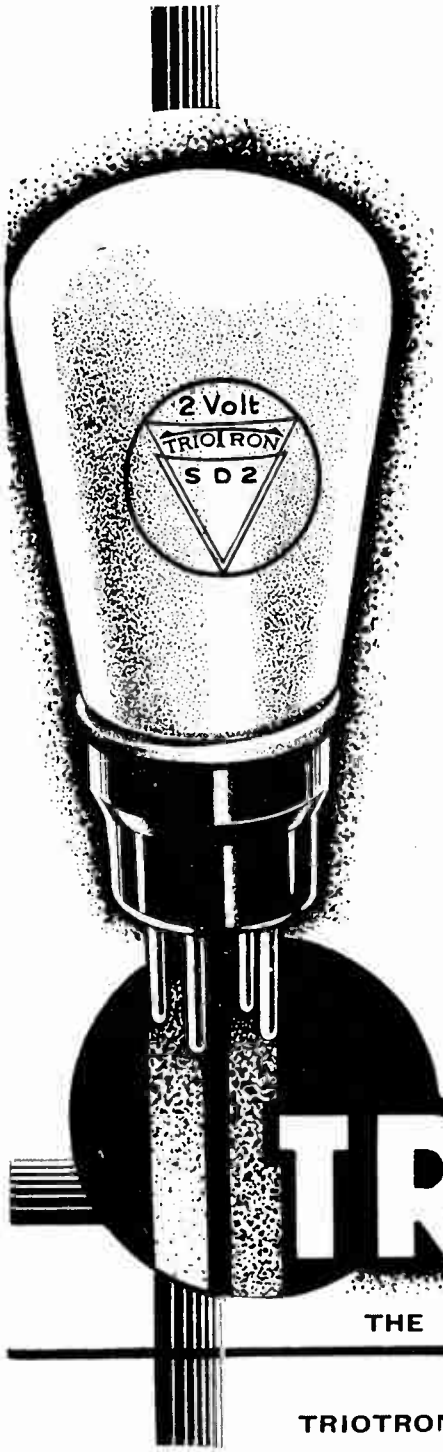

From the early, pioneer days of Radio TRIOTRON VALVES have been in the forefront for high technical efficiency and uniformity. Many of the most notable improvements in valve design and manufacture originated in the TRIOTRON laboratories.

The A.C. types listed below are the modern replacements for the now obsolete types in use in the majority of last year's receivers.

INDIRECTLY HEATED A.C. VALVES
Filament voltage 4 v. Filament current 1 amp.

Type.	Max. Anode Voltage.	Max. Aux. Grid Voltage.	Slope.	Amplification	
S.434N.	200	100	3.5	2,000	(Var. Mu. Pen.)
S.435N.	200	100	3.5	5,000	(H.F. Pentode)
A.440N.	200	—	4.0	120	(Spec. Detec.)
P.440N.	250	250	3.5	175	(Pentode)

INDIRECTLY HEATED D.C. VALVES
Filament voltage 20v. Filament current 1 amp.

Type.	Max. Anode Voltage.	Max. Aux. Grid Voltage.	Slope.	Amplification	
S.2034N.	200	100	3.5	2,000	(Var. Mu. Pen.)
S.2035N.	200	100	3.5	5,000	(H.F. Pentode)
A.2040N.	200	—	4.0	100	(Spec. Detec.)
P.2020N.	200	200	2.5	70	(Pentode)

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THE VALVE FOR THE MULTI-MILLION AERIALS!

TRIOTRON RADIO CO. LTD.,
TRIOTRON HOUSE, BLOOMSBURY STREET, LONDON, W.C.1.

TRIODE VALVES—(*Continued*)

(A.C. Resistance greater than 7,000 ohms).

Type.		Filament.		A.	Average Anode Current for A & B (mA.).	At Zero Grid Volts and 100 v. H.T.			B.	Pins in Base.	Price.
		Volts.	Amps.	Max. Anode Volts.		A.C. Resistance (Ohms).	Mutual Conductance (mA V.).	Amplification Factor.	Grid Bias for A.		
Ferranti	D 4	4.0*	1.0	200	4.0	12,500	3.3	41.3	3.0	5	13 6
Hivac	H 210	2.0	0.1	150	1.0	22,000	1.15	25	−3.0	4	4 6
	D 210	2.0	0.1	150	3.5	12,000	1.25	16	−3.0	4	5 6
	L 210	2.0	0.1	150	4.0	8,600	1.2	10	−6.0	4	4 6
Lissen	H 2	2.0	0.1	150	1.0	45,000	1.1	50	−1.5	4	5 6
	HL 2	2.0	0.1	150	1.5	22,000	1.6	35	−3.0	4	5 6
	L 2	2.0	0.1	150	2.0	10,000	2.0	20	−4.5	4	5 6
	AC/HL	4.0*	1.0	200	3.0	10,000	4.0	40	−4.5	5	13 6
	HL 16	16.0*	0.25	200	3.0	10,000	4.0	40	−4.5	5	13 6
Marconi and Osram.	H 210	2.0	0.1	150	1.5	50,000	0.7	35	−1.5	4	7/−
	H 2	2.0	0.1	150	1.5	35,000	1.0	35	−1.5	4	7/−†
	HL 210	2.0	0.1	150	1.5	20,000	1.2	24	−3.5	4	7/−†
	HL 2	2.0	0.1	150	2.0	18,000	1.5	27	−3.0	4	7/−†
	L 210	2.0	0.1	150	3.0	12,000	0.92	11	−7.0	4	7/−
	L 21	2.0	0.1	150	2.2	8,900	1.8	16	−6.0	4	7/−
	MH 4 (Catkin)	4.0*	1.0	200	4.5	11,100	3.6	40	−3.0	5	13/6†
	MH 41	4.0*	1.0	200	5.0	13,300	6.0	80	−4.5	5	13/6†
	MHL 4	4.0*	1.0	200	8.0	8,000	2.5	20	−6.0	5	13/6†
	DH	16.0*	0.25	200	6.0	10,800	3.7	40	−3.0	5	13/6†
Mazda	H 2	2.0	0.1	150	0.8	45,000	1.1	50	−1.5	4	7/− (M)
	HL 210	2.0	0.1	150	2.2	18,500	1.4	26	−2.5	4	7/−
	HL 2	2.0	0.1	150	2.7	21,000	1.5	32	−1.5	4	7/− (M)
	L 2	2.0	0.1	150	5.0	10,000	1.9	19	−3.0	4	7/−†
	AC/HL	4.0*	1.0	200	5.0	11,700	3.0	35	−3.5	5	13/6†
	AC 2/HL	4.0*	1.0	200	6.2	11,500	6.5	75	−1.5	5	13/6†
	DC/HL	6.0*	0.5	200	4.5	13,000	2.7	35	−3.5	5	13/6†
	DC 3/HL	25.0*	0.1	200	5.0	11,700	3.0	35	−3.5	5	13/6†
Micromesh	HLB 1	2.0	0.1	150	2.0	16,000	1.5	24	−3.0	4	7/−
	HLA 1	4.0*	1.0	200	5.0	10,000	8.0	80	−1.0	5	13/6
	HLA 2	4.0*	1.0	200	6.0	9,000	5.5	50	−2.5	5	13/6
Mullard	PM 1 HL	2.0	0.1	150	2.0	20,000	1.4	28	−3.0	4	7/−†
	PM 2 DX	2.0	0.1	150	4.0	12,000	1.5	18	−4.5	4	7/−†
	904 V	4.0*	1.0	200	1.8	34,000	2.2	75	−2.0	5	13/6†
	354 V	4.0*	1.0	200	4.0	12,000	3.0	36	−4.0	5	13/6†
	244 V	4.0*	1.0	200	5.5	9,000	2.8	25	−3.3	5	13/6 (M)
	HL 20	20.0*	0.18	200	3.5	14,000	2.5	35	−3.5	5	13/6 (M)
Ostar-Ganz	A 520	250 max.*	0.024	300	4.0	8,800	2.5	22	−7.0	5	17/6
	W 310	250 max.*	0.024	300	1.0	31,000	1.0	32	−7.0	5	17/6
	D 130	250 max.*	0.024	300	2.0	40,000	3.5	100	−1.0	5 and 7	17/6
Pix	2	2.0	0.1	150	1.5	20,000	1.0	20	−4.0	4	4/6
	3	2.0	0.1	150	3.4	12,000	0.9	11	−7.5	4	4/6
	4	2.0	0.1	150	1.0	37,000	0.9	33	−1.0	4	—
	90 AC	4.0*	1.0	200	3.0	23,000	1.7	40	−1.5	5	11/6
	100 AC	4.0*	1.0	200	5.0	7,500	2.0	15	−6.0	5	11/6
Six-Sixty	SS 210 HF	2.0	0.1	150	1.0	25,000	0.75	19	−4.0	4	7/−
	SS 210 D	2.0	0.1	150	2.0	10,600	1.6	17	−4.5	4	7/−
	SS 210 HL	2.0	0.1	150	2.0	20,000	1.4	28	−1.5 3.0	4	7/−
	SS 4 GPAC	4.0*	1.0	200	4.0	12,000	3.0	36	−4.0	5	13 6
	SS 4 DXAC	4.0*	1.0	200	3.0	17,700	4.8	85	−1.5	5	13/6
	SS 4 HLAC	4.0*	1.0	200	—	9,500	2.65	25	—	5	13/6
362	H 2	2.0	0.1	150	2.0	32,000	1.0	32	—	4	3/6
	HL 2	2.0	0.1	150	3.5	16,000	1.5	24	−3.0	4	3/6
	L 2	2.0	0.1	150	5.0	12,000	1.2	15	−6.0	4	3/6
	ACH 4	4.0*	1.0	200	3.0	15,000	3.3	50	−4.0	5	7/6

* Indirectly heated. (M) Metallised only. † Plain or metallised.

TRIODE VALVES—(*Continued*)

(A.C. Resistance greater than 7,000 ohms).

Type.		Filament. Volts.	Filament. Amps.	A. Max. Anode Volts.	Average Anode Current for A & B (mA.).	At Zero Grid Volts and 100 v. H.T. A.C. Resistance (Ohms).	Mutual Conductance (mA V.).	Amplification Factor.	B. Grid Bias for A.	Pins in Base.	Price.
Triotron	WD 2	2.0	0.08	200	1.0	37,000	1.0	37	−2.5	4	5/−
	HD 2	2.0	0.08	200	5.0	15,000	1.0	15	−5.0	4	5/−
	SD 2	2.0	0.1	200	7.0	12,000	1.5	18	−5.0	4	5/−
	TD 2	2.0	0.08	150	7.0	10,000	0.9	9	−7.0	4	5/−
	A 430 N	4.0*	1.0	200	6.0	10,000	2.4	24	−3.5	5	8 6
	A 440 N	4.0*	1.0	200	0.2	30,000	4.0	120	−1.5	5	8 6
	A 2040 N	20.0*	0.18	200	0.2	30,000	4.0	120	−1.5	5	8 6
Tungsram	R 208	2.0	0.1	200	1.0	50,000	0.7	35	−3.0	4	5 6
	HR 210	2.0	0.1	200	2.0	23,000	1.3	30	−4.0	4	5/6
	PD 220	2.0	0.2	150	4.0	10,000	1.7	17	−6.0	4	6 −
	L 210	2.0	0.1	200	3.0	16,000	1.0	16	−6.0	4	5 6
	AR 4101	4.0*	1.0	200	2.5	13,300	3.0	40	−2.0	5	10 6
	AR 495	4.0*	1.0	200	4.5	17,000	5.0	85	−1.5	5	10 6
	AG 4100	4.0*	1.0	200	5.0	8,000	2.0	16	−4.0	5	9 6
	R 2018	20.0*	0.18	200	2.5	13,300	3.0	40	−2.0	5	10 6
	G 2018	20.0*	0.18	200	10.0	7,000	3.5	25	−5.0	5	10 6

TRIODE VALVES

(A.C. Resistance less than 7,000 ohms.)

Type.		Filament. Volts.	Filament. Amps.	A. Max. Anode Volts.	B. Average Anode Current (mA.).	C. Grid Bias (for A).	Max. Anode Watts.	At Zero Grid Bias and 100 Volts H.T. A.C. Resistance (Ohms).	At Zero Grid Bias and 100 Volts H.T. Mutual Conductance (mA V.).	D. Optimum Load (for A, B, & C) (Ohms).	E. Power Output (for A, B, C & D) (Milliwatts).	F. Bias Resistance (for A, B & C) (Ohms).	Pins in Base.	Price.
Clarion	LP 2	2.0	0.11	150	8.0	− 9.0	—	5,500	1.1	12,000	75	—	4	6/9
	P 2	2.0	0.22	150	12.0	− 18.0	—	2,850	1.4	7,500	200	—	4	8 6
	PX2	2.0	0.22	150	22.0	− 22.0	—	1,850	1.5	5,000	400	—	4	8 6
	ACG	4.0*	1.0	200	8.0	− 7.5	—	6,000	2.7	12,000	200	1,000	5	9 6
	ACL	4.0*	1.0	200	18.0	− 12.0	—	3,000	3.0	7,000	500	700	5	9 6
	ACP	4.0	1.0	200	19.0	− 21.0	—	2,000	3.0	4,500	700	1,100	4	10 −
Cossor	215 P	2.0	0.15	150	10.0	− 7.5	1.5	4,000	2.25	9,000	150	—	4	8 9
	220 P	2.0	0.2	150	11.0	− 7.5	1.65	4,000	2.25	9,000	170	—	4	8 9
	220 PA	2.0	0.2	150	10.0	− 4.5	1.5	4,000	4.0	9,000	180	—	4	8 9
	230 XP	2.0	0.3	150	22.0	− 18.0	3.3	1,500	3.0	3,560	450	—	4	12 −
	41 MP	4.0*	1.0	200	24.0	− 7.5	4.8	2,500	7.5	3,000	1,250	320	5	14 −
	41 MXP	4.0*	1.0	200	40.0	− 12.5	8.0	1,500	7.5	2,000	2,000	300	5	16/6
	4 XP	4.0	0.6	200	45.0	− 23.0	9.0	1,200	4.0	2,800	1,000	500	4	16/6
	680 XP	6.0	0.8	400	25.0	− 125.0	10.0	2,750	1.1	5,700	2,500	5,000	4	25/−
	620 T	6.0	2.0	400	62.5	− 95.0	25.0	1,300	2.3	4,000	5,000	1,500	4	25/−
	660 T	6.0	4.5	500	120.0	− 120.0	60.0	800 1,000	2.25/2.5	2,400	11,000	1,000	4	105/−
	DP	16.0*	0.25	200	25.0	− 7.5	5.0	2,800	6.0	3,500	1,250	300	5	15/−
Dario	TB 032 A	2.0	0.18	150	12.0	− 15.0	—	3,000	2.0	7,000	250	—	4	6 6
	Mag. Power	4.0	0.3	200	24.0	− 18.0	—	2,200	3.8	5,000	750	750	4	10 6
	TE 094	4.0*	1.0	200	14.0	− 12.0	—	3,000	3.0	7,000	600	850	5	10 −
	D C. Super Power	20.0*	0.18	200	15.0	− 18.0	—	2,400	2.5	7,000	600	1,200	5	12 6
Eta	BW 1304	2.0	0.2	150	6.0	− 6.0	—	4,000	3.2	8,000	130	—	4	7/6
	BX 604	2.0	0.2	150	8.0	− 12.0	—	4,000	1.5	8,500	170	—	4	8/−
	BW 602	2.0	0.32	150	12.0	− 12.0	—	1,900	3.4	5,500	330	—	4	8/−

* Indirectly heated. (M) Metallised only. † Plain or metallised.

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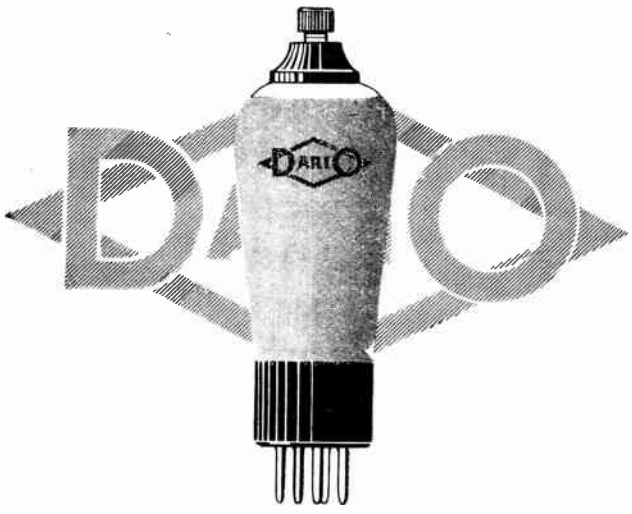

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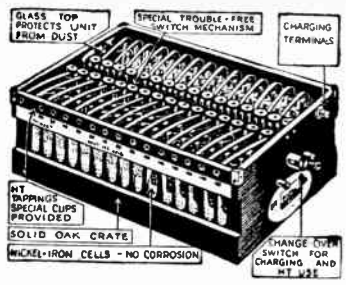

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BIII

TRIODE VALVES—(*Continued*)

(A.C. Resistance less than 7,000 ohms.)

Type.		Filament		A.	B.	C.		At Zero Grid Bias and 100 Volts H.T.		D.	E.	F.		
		Volts.	Amps.	Max. Anode Volts.	Average Anode Current (mA.).	Grid Bias (for A).	Max. Anode Watts.	A.C. Resistance (Ohms).	Mutual Conductance (mA V.).	Optimum Load (for A, B, & C) (Ohms).	Power Output (for A, B, C & D) (Milliwatts).	Bias Resistance (for A, B & C) (Ohms).	Pins in Base.	Price.
Eta	DW 802	4.0	0.57	250	26.0	− 25.0	—	2,000	4.0	5,000	1,300	1,000	5	12/6
	GW 402	7.5	1.25	450	55.0	− 80.0	—	1,800	1.8	4,000	6,000	1,750	4	30/–
Ferranti	LP 4	4.0	1.0	250	48.0	− 36.0	12.0	870	5.4	4,000	2,500	750	4	16/6
Hivac	P 220	2.0	0.2	150	6.0	− 7.5	3.75	4,800	2.5	9,000	175	—	4	5/6
	PP 220	2.0	0.2	150	12.5	− 12.0	6.75	2,400	2.75	5,000	250	—	4	6/6
	PX 230	2.0	0.3	150	17.5	− 15.0	10.0	1,850	3.5	4,000	450	—	4	7/6
Lissen	LP 2	2.0	0.2	150	9.0	− 6.0	1.5	3,500	3.5	9,000	200	—	4	8/9
	P 220 A	2.0	0.2	150	14.0	− 15.0	2.5	1,700	3.5	8,000	350	—	4	12/–
	P 220	2.0	0.2	150	7.6	− 13.5	1.5	4,000	1.75	10,000	160	—	4	7/3
	P 240 A	2.0	0.4	150	25.0	− 21.0	4.0	1,000	5.0	3,500	550	—	4	—
	PX 240	2.0	0.4	200	25.0	− 32.0	5.0	1,500	3.0	5,000	800	—	4	8/–
	P 425	4.0	0.25	200	25.0	− 32.0	5.0	1,500	3.0	5,000	800	1,280	4	8/–
	P 625 A	6.0	0.25	200	30.0	− 30.0	6.0	1,500	3.0	3,500	900	1,000	4	8/–
	AC/P	4.0*	1.0	200	20.0	− 13.5	4.0	2,800	3.6	6,000	450	680	5	14/–
Marconi and Osram.	P 215	2.0	0.15	150	8.5	− 12.0	—	5,000	1.4	12,000	150	—	4	8/9
	LP 2	2.0	0.2	150	11.5	− 4.5	—	3,900	3.85	7,100	150	—	4	8/9
	P 2	2.0	0.2	150	19.0	− 10.5	—	2,150	3.5	4,500	300	—	4	12/–
	ML 4	4.0*	1.0	200	20.0	− 9.0	5.0	2,860	4.2	7,000	650	400	5	14/–
	DL	16.0*	0.25	200	25.0	− 8.0	5.0	2,660	4.5	7,000	600	350	5	14/–
	PX 4	4.0	1.0	250	48.0	− 34.0	12.0	830	6.0	3,200	2,500	750	4	16/6
	LS 6 A	6.0	2.0	100	63.0	− 91.0	25.0	1,300	2.3	3,250	5,000	1,500	4	30/–
	PX 25	4.0	2.0	400	62.5	− 31.0	25.0	1,265	8.0	3,200	5,500	530	4	25/–
	DA 60	6.0	4.0	500	120.0	−135.0	60.0	835	3.0	3,000	10,000	1,150	Special	110/–
Mazda	P 215	2.0	0.15	150	5.8	− 13.5	—	4,400	1.7	11,000	180	—	4	8/9
	P 220	2.0	0.2	150	5.6	− 6.9	—	3,700	3.1	9,600	160	—	4	8/9
	P 220 A	2.0	0.2	150	15.0	− 14.0	—	1,850	3.5	4,100	350	—	4	12/–
	AC/P	4.0*	1.0	200	17.0	− 13.5	—	2,650	3.75	6,000	650	800	5	14/–
	AC/P 1	4.0*	1.0	200	24.0	− 28.0	—	1,450	3.7	5,000	1,000	1,200	5	16/6
	PP 3/250	4.0	1.0	250	40.0	− 30.0	12.0	1,000	6.5	2,300	2,500	715	4	16/6
	PP 5/400	4.0	2.0	400	62.5	− 32.0	25.0	1,500	6.0	2,700	5,900	510	4	25/–
	DC/P	8.0*	0.5	200	16.0	− 14.0	—	2,220	4.5	6,000	650	800	5	14/–
	DC 2/P	35.0*	0.1	200	17.0	− 13.5	—	2,650	3.75	6,000	650	800	5	14/–
Micromesh	PB 1	2.0	0.2	150	7.0	− 6.0	—	4,000	4.0	10,000	150	—	4	8/9
	PA 1	4.0*	1.0	200	40.0	− 10.5	10.0	1,050	12.0	4,000	1,250	260	5	16/6
Mullard	PM 2 A	2.0	0.2	150	6.0	− 7.0	—	3,600	3.5	7,000	150	—	4	8/9
	PM 202	2.0	0.2	150	14.0	− 15.0	—	2,000	3.5	3,700	350	—	4	12/–
	164 V	4.0*	1.0	200	8.5	− 8.5	—	4,850	3.3	—	—	1,000	5	14/–
	104 V	4.0*	1.0	200	20.0	− 11.0	—	3,000	4.0	6,000	550	550	5	14/–
	AC 044	4.0	1.0	250	48.0	− 29.0	12.0	950	6.8	2,500	2,700	600	4	16/6
	DO 24	4.0	2.0	400	63.0	− 34.0	25.0	1,390	6.5	4,000	5,000	540	4	25/–
	DO 26	4.0	2.0	400	63.0	− 92.0	25.0	600	6.3	4,000	7,500	1,500	4	25/–
	DO 60	6.0	4.0	500	120.0	− 95.0	60.0	1,000	3.5	1,500	10,000	800	Special	110/–
	DO 75	10.0	2.0	1,000	75.0	− 55.0	75.0	2,000	6.0	6,000	18,000	735	Special	160/–
	DO 25	6.0	1.1	400	63.0	−112.0	25.0	800	3.75	4,000	7,000	1,780	4	30/–
Ostar-Ganz	U 920	250 max.*	0.024	300	7.0	− 14.0	—	3,700	3.0	—	700 800	—	5	17/6
	L 1525	250 max.*	0.024	300	20.0	− 26.0	—	1,850	3.0	—	800 1,000	—	5	18/–
	K 3560	250 max.*	0.044	220	70.0	− 50.0	15.0	500	6.0	1,200	4,000 5,000	800	5	25/6
Pix	20	2.0	0.15	150	5.0	− 5.0	—	4,000	1.2	8,000	150	—	4	6/6
	120	2.0	0.2	150	12.0	− 12.0	—	3,900	1.8	6,000	200	—	4	8/6
	230	2.0	0.3	150	18.0	− 20.0	—	2,300	3.0	4,000	300	—	4	10/6
Six-Sixty	SS 220 P	2.0	0.2	150	6.0	− 12.0	—	4,800	1.5	9,000	150	—	4	8/9
	SS 220 PA	2.0	0.2	150	8.0	− 6.0	1.5	3,600	3.5	7,000	150	—	4	8/9
	SS 220 SP	2.0	0.2	150	14.0	−12/15	3.0	2,000	3.5	3,700	350	—	4	12/–

* Indirectly heated.

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Type Nos.	Filament Volts	Filament Current	Amplification Factor	Mutual Conductance in ma/v	Impedance in ohms	A.C. Power Output in milliwatts	PRICES
H 210	2.0	0.1	25	1.15	22,000	—	4/6
L 210	2.0	0.1	10	1.2	8,600	—	
D 210	2.0	0.1	16	1.2	13,000	—	5/6
P 220	2.0	0.2	12	2.5	4,800	175	
PP 220	2.0	0.2	6.5	2.75	2,400	250	6/6
PX 230	2.0	0.3	6.5	3.5	1,850	450	7/6
SG 210	2.0	0.1	250	1.0	250,000	—	10/6
VS 210	2.0	0.1	—	1.0	—	—	
Y 220	2.0	0.2	—	2.20	—	500	12/6
Z 220	2.0	0.2	—	2.20	—	750	
B 220	2.0	0.2	—	anode—anode load 14,500	—	1,250	10/6

TRIODE VALVES—(*Continued*)

(A.C. Resistance less than 7,000 ohms.)

Type.		Filament.		A.	B.	C.		At Zero Grid Bias and 100 Volts H.T.		D.	E.	F.		
		Volts.	Amps.	Max. Anode Volts.	Average Anode Current (mA.).	Grid Bias (for A).	Max. Anode Watts.	A.C. Resistance (Ohms).	Mutual Conductance (mA/V.).	Optimum Load (for A, B, & C) (Ohms).	Power Output (for A, B, C & D) (Milliwatts).	Bias Resistance (for A, B & C) (Ohms).	Pins in Base.	Price.
Six-Sixty ..	SS 240 SP	2.0	0.4	150	15.0	— 12.0	—	1,900	3.5	4,000	500	—	4	12/-
	SS 4 LAC	4.0*	1.0	200	7.0	— 8.5	—	5,000	3.2	—	—	—	5	14/-
	SS 4 PAC	4.0*	1.0	200	15.0	— 12.0	—	3,170	3.8	—	—	—	5	14/-
	SS 4 SPAC	4.0*	1.0	200	30.0	— 28.0	—	1,250	4.0	4,000	1,000	—	5	16/6
	SS HV 4/1	4.0	1.0	200	20.0	— 21.0	—	2,000	3.0	5,000	750	1,250	4	16/-
	SS HV 4 2	4.0	1.0	250	48.0	— 29.0	12.0	950	6.8	2,500	2,700	600	4	16/6
	SS HV 6/5	6.0	1.8	400	63.0	— 112.0	25.0	800	3.75	4,000	7,000	1,780	4	30/-
362	LP 2	2.0	0.2	180	6.0	— 12.0	—	5,000	3.0	—	—	—	4	4/-
	P 2	2.0	0.2	180	9.0	— 15.0	—	3,000	3.0	—	—	—	4	4/6
	ACL 4	4.0*	1.0	250	9.0	— 15.0	—	5,000	4.0	—	—	—	5	7/6
	ACP 4	4.0*	1.0	250	20.0	— 20.0	—	2,000	4.0	—	—	1,000	5	8/6
Triotron	ZD 2	2.0	0.15	150	10.0	— 15.0	3.0	5,000	1.0	13,000	150	—	4	6/6
	UD 2	2.0	0.22	150	15.0	— 15.0	3.0	2,700	1.5	7,500	500	—	4	6/6
	E 235	2.0	0.33	200	18.0	— 12.0	4.0	3,600	2.5	8,000	550	—	4	6/6
	E 425	4.0	0.3	250	20.0	— 32.0	5.0	2,600	2.0	3,000	1,000	—	4	7/-
	K 435/10	4.0	0.65	250	40.0	— 40.0	10.0	1,300	3.5	1,500	2,500	600	4	12/6
	K 480	4.0	2.0	550	45.0	— 36.0	25.0	2,500	8.0	3,000	5,000	800	4	22/6
	K 450/50	4.0	3.0	400	120.0	— 50.0	50.0	1,250	5.0	1,500	12,000	500	4	45/-
	E 430 N	4.0*	1.0	200	15.0	— 15.0	3.0	3,000	3.0	10,000	350	1,000	5	8/6
	E 2020 N	20.0*	0.18	200	15.0	— 15.0	3.0	3,600	2.0	11,000	300	1,000	5	8/6
Tungsram ..	P 215	2.0	0.15	150	12.0	— 18.0	—	3,300	1.5	7,000	280	—	4	7/-
	SP 220	2.0	0.2	150	15.0	— 15.0	—	2,200	3.0	6,700	360	—	4	7/3
	SP 230	2.0	0.3	180	18.0	— 23.0	—	2,500	2.0	6,000	460	—	4	8/-
	AG 495	4.0*	1.0	200	6.0	— 6.0	—	6,250	4.0	15,000	200	1,000	5	10/6
	AP 495	4.0*	1.0	250	20.0	— 18.0	5.0	2,500	4.0	5,000	900	900	5	13/6
	P 460	4.0	0.6	220	50.0	— 33.0	12.5	1,100	3.5	4,000	1,200	700	4	13/6
	P 4100	4.0	1.0	400	35.0	— 35.0	15.0	1,400	5.0	6,000	3,500	1,000	4	14/-
	P 2018	20.0*	0.18	200	25.0	— 18.0	5.0	2,800	2.5	6,000	900	750	5	13/-

OUTPUT PENTODE VALVES

Type.		Filament.		A.	B.	C.	D.	E.	F.	Max. Undistorted Output (for A, B, C, D, E & F) (Milliwatts).	Bias Resistance (for A, B, C, D & E) (Ohms).	Max. Anode Watts.	Pins in Base.	Price.
		Volts.	Amps.	Max. Anode Volts.	Max. Screen Volts.	Average Anode Current (mA.).	Average Screen Current (mA.).	Grid Bias (for A & B).	Optimum Load (for A, B, C, D & E) (Ohms).					
Clarion	PN 2	2.0	0.22	150	150	6.0	0.75	— 7.5	18,000	500	—	—	5	13/6
	ACPN	4.0*	1.0	250	200	22.0	8.0	—12.0	9,000	2,000	400	—	5	15/-
Cossor	230 PT	2.0	0.3	150	150	14.0	3.0	— 15.0	10,000	1,000	—	—	4 and 5	16/6
	220 PT	2.0	0.2	150	150	19.0	4.0	— 9.0	7,500	1,000	—	—	4 and 5	16/6
	220 HPT	2.0	0.2	150	150	8.0	1.5	— 4.5	17,000	500	—	—	4 and 5	16/6
	MP/Pen ..	4.0*	1.0	250	250	30.0	6.0	—16.0	8,500	3,100	450	7.5	5 and 7	18/6
	P.T. 41	4.0	1.0	250	200	30.0	6.0	—12.5	8,000	2,600	350	7.5	4	18/6
	P.T. 41 B	4.0	1.0	400	300	30.0	6.0	—40.0	8,000	3,600	1,100	12.0	4	22/6
	DP/Pen	16.0*	0.25	250	250	30.0	6.0	—10.0	10,000	3,000	300	7.5	5 and 7	18/6
Dario	TC 432 N	2.0	0.2	150	150	15.0	4.0	—10.0	11,000	400	—	—	—	12/6
	TE 634 A	4.0*	1.0	250	250	24.0	7.0	—15.0	8,000	2,000	500	—	5	13/6
	DC Polyodion ..	20.0*	0.18	200	200	20.0	6.0	—18.0	8,000	2,000	700	—	5	15/6
Eta	BY 3	2.0	0.3	150	150	10.0	8.0	— 4.5	7,500	450	—	—	4 and 5	14/-
	DW 3	4.0	0.25	300	200	20.0	5.0	—19.0	7,500	1,500	1,000	—	4 and 5	15/-
	DW 9	4.0*	1.0	300	250	32.0	7.0	—10.5	7,800	2,000	300	—	5	16/-

* Indirectly heated.

OUTPUT PENTODE VALVES—(*Continued*)

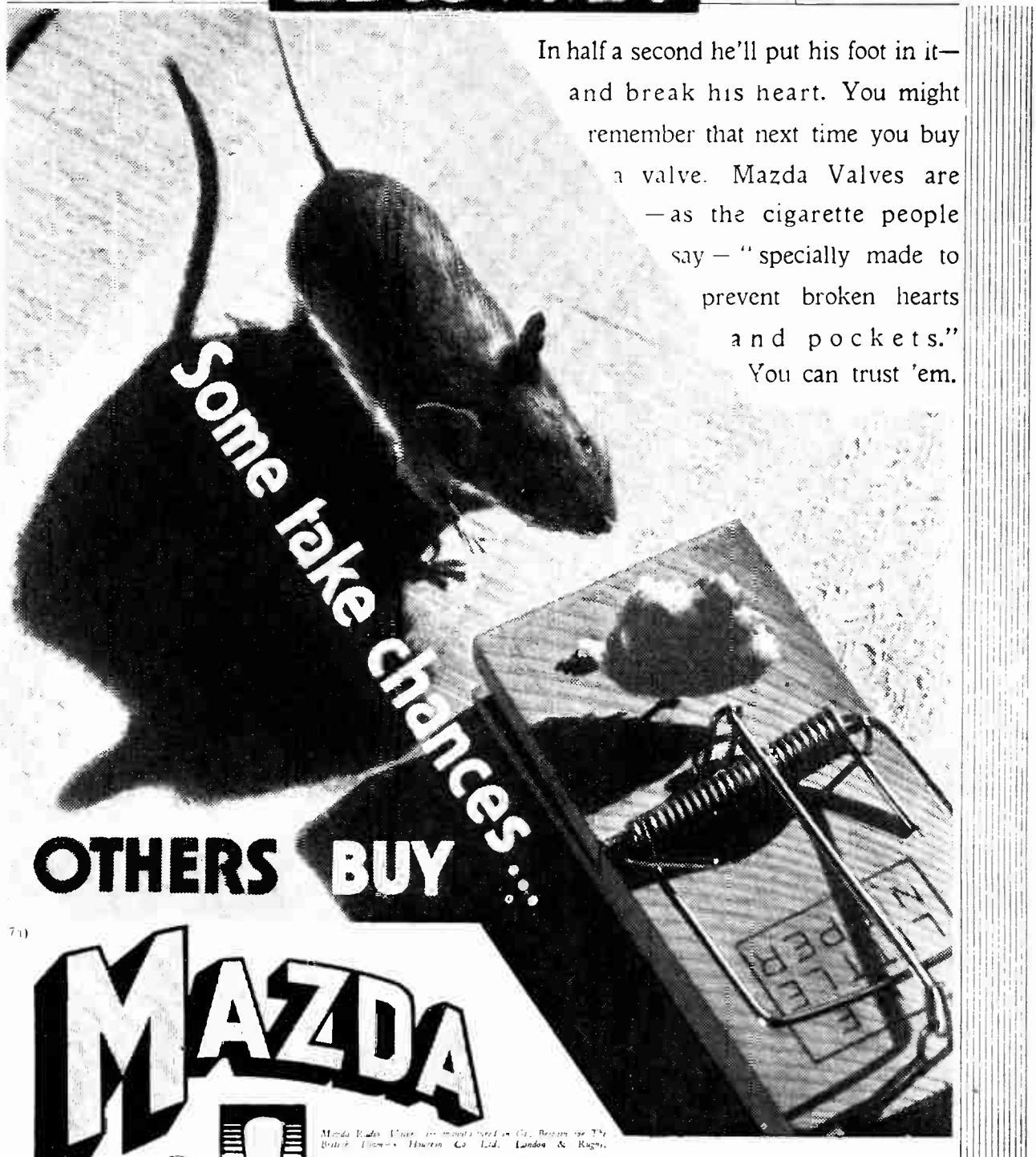
Type.		Filament.		A.	B.	C.	D.	E.	F.	Max. Undistorted Output (for A, B, C, D, E & F) (Milliwatts).	Bias Resistance (for A, B, C, D & E) (Ohms).	Max. Anode Watts.	Pins in Base.	Price.
		Volts.	Amps.	Max. Anode Volts.	Max. Screen Volts.	Average Anode Current (mA.).	Average Screen Current (mA.).	Grid Bias (for A & B).	Optimum Load (for A, B, C, D & E) (Ohms).					
Hivac	Y 220	2.0	0.2	150	150	11.5	2.0	− 6.0	12,000	500	—	3.5	4 and 5	12/6
	Z 220	2.0	0.2	150	150	18.0	4.0	− 9.0	7,600	750	—	5.5	4 and 5	12/6
Lissen	P.T. 225	2.0	0.25	150	150	8.0	2.0	− 6.0	18,700	300	—	1.5	4	12/6
	P.T. 2 A	2.0	0.2	150	150	18.0	3.0	−10.5	8,500	1,100	—	3.0	4	12/6
	P.T. 240	2.0	0.4	200	150	16.0	4.0	−10.5	12,500	800	—	3.5	4	16/-
	AC/PT	4.0*	1.0	250	200	31.0	4.0	−10.0	7,500	2,000	300	7.5	5	18/6
	P.T. 16	16.0*	0.25	250	200	31.0	4.0	−10.0	7,500	2,000	300	7.5	5	18/6
Marconi and Osram	P.T. 2	2.0	0.2	150	150	6.5	1.9	− 4.5	17,000	500	—	—	5	16/6
	P.T 4	4.0	1.0	250	250	32.0	8.0	−11.0	7,500	2,500	270	8.0	5	18/6
	MPT 4 (**Catkin**) ..	4.0*	1.0	250	250	32.0	8.0	−13.0	9,000	3,200	340	8.0	5 and 7	18/6
	P.T. 16	4.0	1.0	300	300	53.0	10.0	−15.0	5,000	6,300	270	16.0	5	25/-
	P.T. 25	4.0	2.0	400	200	62.5	10.0	−22.0	6,000	10,000	330	25.0	5	45/-
	D.P.T.	16.0*	0.25	200	200	40.0	6.5	−10.0	8,000	2,000	250	8.0	5	18/6
Mazda	Pen 220	2.0	0.2	150	150	9.0	1.6	− 4.5	14,000	600	—	—	5	16/6
	Pen 220 A	2.0	0.2	150	150	18.0	3.0	− 9.0	6,000	1,100	—	—	5	16/6
	AC/Pen	4.0*	1.0	250	250	32.0	5.0	−15.5	7,500	3,400	400	8.0	5 and 7	18/6
	AC 2/Pen	4.0*	1.75	250	250	32.0	6.0	− 5.2	6,500	3,400	140	8.0	7	18/6
	DC/Pen	8.0*	0.5	250	200	30.0	5.0	−10.0	10,000	2,300	300	8.0	5	17/6
	DC 2/Pen	35.0*	0.1	250	200	30.0	5.0	−10.0	10,000	2,300	300	8.0	5	18/6
Micromesh ..	Pen B 1	2.0	0.2	150	150	8.0	1.8	− 4.5	18,000	500	—	—	5	16/6
	7 A 2	4.0*	1.2	250	250	32.0	8.0	−17.0	8,000	3,000	330	—	7	18/6
	Pen A 1	4.0	1.0	250	250	32.0	7.0	−16.0	8,000	2,850	450	—	5	18/6
Mullard ..	PM 22 A	2.0	0.2	150	150	9.5	2.0	− 4.5	15,000	425	—	—	5	16/6
	PM 22	2.0	0.3	150	150	15.0	4.0	−10.0	8,000	600	—	—	5	16/6
	Pen 4 V	4.0*	1.0	250	200	28.0	7.0	−13.0	10,000	2,000	350	8.0	5	18/6
	Pen 4 VA	4.0*	1.5	250	250	32.0	12.0	−22.0	6,000	3,400	500	8.0	7	18/6
	PM 24 M	4.0	1.0	250	250	30.0	7.0	−18.0	8,000	3,000	500	7.5	5	18/6
	PM 24 A	4.0	0.275	300	200	20.0	3.5	−22.5	10,000	1,900	1,000	6.0	5	18/6
	PM 24 D	4.0	2.0	500	200	50.0	9.0	−35.0	7,000	10,000	600	25.0	5	45/-
	Pen 20	20.0*	0.18	200	200	25.0	9.0	−15.0	8,000	1,500	450	6.0	7	18/6
Ostar-Ganz ..	Multigrid PT 3 ..	250 max.*	0.024	300	200	20.0	—	−16/20	10,000	2,000/2,500	800/1,000	6.0	7	19/9
Six-Sixty ..	SS 220 Pen	2.0	0.2	150	150	9.5	—	− 4.5	15,000	425	—	—	5	16/6
	SS 230 PP	2.0	0.3	150	150	15.0	—	−10.0	8,000	400	—	3.0	5	16/6
	SS 4 Pen M	4.0	1.0	250	250	30.0	6.0	−18.0	8,000	3,000	500	7.5	5	18/6
	SS 4 Pen SP	4.0	0.275	300	200	20.0	—	−22.5	10,000	1,500	—	—	5	18/6
	SS 4 Pen AC ..	4.0*	1.0	250	200	28.0	6.3	−12.0	10,000	2,000	350	9.0	5	18/6
	SS 4 Pen AAC ..	4.0*	1.5	250	250	32.0	12.0	−22.0	8,000	3,400	500	—	7	18/6
362	ME 2	2.0	0.2	200	150	8.0	2.0	− 9.0	6,000	—	—	—	4 and 5	10/-
	AC PN 4	4.0*	1.0	250	200	20.0	4.0	−24.0	6,000	2,500	1,000	—	5 and 7	15/-
Triotron	P 225	2.0	0.2	150	150	8.0	2.0	− 4.5	15,000	500	—	3.0	5	10/6
	P 425	4.0	0.25	300	200	20.0	5.0	−25.0	10,000	1,500	1,000	6.0	5	12/6
	P 435	4.0	1.1	250	250	36.0	6.0	−14.0	8,000	2,500	350	9.0	5	13/6
	P 440	4.0	2.0	550	200	45.0	10.0	−40.0	7,000	8,000	730	25.0	5	30/-
	P 440 N	4.0*	1.1	250	250	24.0	5.0	−15.0	7,500	2,000	500	6.0	5	12/6
	P 2020 N	20.0*	0.18	200	200	20.0	4.0	−18.0	10,000	1,000	750	4.0	5	12/6
Tungsram ..	PP 220	2.0	0.2	200	150	6.0	2.0	−10.0	13,000	300	—	—	4 and 5	14/-
	PP 230	2.0	0.3	200	150	12.0	4.0	−16.0	11,000	420	—	—	4 and 5	14/-
	PP 4100	4.0	1.0	400	300	30.0	7.0	−40.0	7,500	3,000	1,000	12.5	5	16/-
	APP 4100	4.0*	1.0	300	250	30.0	7.0	−40.0	7,500	3,000	1,000	12.5	5	17/-
	APP 4120	4.0*	1.2	250	250	32.0	8.0	−22.0	6,000	3,000	500	10.0	5	17/-
	PP 2018	20.0*	0.18	220	200	25.0	5.0	−22.0	8,800	1,100	750	7.5	5	17/-
	PP 4018	40.0*	0.18	180	180	45.0	9.0	−22.0	3,000	3,400	400	9.0	5	17/-

*Indirectly heated.

PURVEYORS OF ELECTRIC LAMPS BY APPOINTMENT

EDISWAN

MANUFACTURERS & PURVEYORS OF ELECTRIC LAMPS BY APPOINTMENT



In half a second he'll put his foot in it—and break his heart. You might remember that next time you buy a valve. Mazda Valves are—as the cigarette people say—"specially made to prevent broken hearts and pockets." You can trust 'em.

OTHERS BUY ...

MAZDA

Mazda Radio Valves are manufactured in Great Britain by The British Thomson-Houston Co. Ltd., London & Rugby.

THE SAFETY VALVE

THE EDISON SWAN ELECTRIC CO. LTD., 155, CHARING CROSS ROAD, W.C.2

CLASS "B" VALVES

Type.		Filament.		A. Max. Anode Volts.	Quiescent Anode Current (Total) (mA.).	Anode Current under Average Signal Conditions (mA.).	Input Impedance (Grid to Grid) (Ohms).	B. Grid Bias (for A).	Optimum Load Resistance (Ohms) (for A & B) (Anode to Anode).	C. Recommended Driver Valve.	Recommended Driver Trs. Ratio with (C) (Whole Primary to Whole Secondary).	Power Output (for A) (Milliwatts).	Pins in Base.	Price.
		Volts.	Amps.											
Clarion	B 22	2.0	0.22	150	1.3	5.0	9,000	0	12,000/15,000	HL 2	1.5 —1	1,200	7	9/-
	B 24	2.0	0.44	150	1.8	7.0	7,200	0	8,000/10,000	LP 2	1.5 —1	2,000	7	11/-
Cossor	220 B	2.0	0.2	120	2.5	6.0	2,900	0	12,000	210 LF	1—1.14	1,250	7	14/-
	240 B	2.0	0.4	150	3.0	8.5	2,500	0	8,000	215 P	1—1.26	2,000	7	14/-
Ferranti	HP 2	2.0	0.4	150	3.0	—	2,000	0	8,000	Cossor 215 P	1—1	2,000	7	14/-
Hivac	B 220	2.0	0.2	150	2.5	5.5	4,000	0	14,500	L 210	1.5 —1	1,250	7	10/6
Lissen	B 2 (Two required)	2.0	0.1	150	4.0	5.0	25,000 per valve.	0	15,000	L 2	1—1	2,000	4	8/-
	BB 240	2.0	0.4	150	5.4	7.0	9,000	0	7,500	LP 2	1—1	3,200	7	14/-
Marconi and Osram.	B 21	2.0	0.2	150	2.2	7.5	36,000	−6	12,000	L 21	1.5 —1	1,500	7	14/-
Mazda	PD 220	2.0	0.2	150	2.0	7.0	3,300	−0.5	12,500	P 220	1.5 —1	2,850	7	14/-
	PD 220 A	2.0	0.2	150	2.3	—	7,400	−6.0	10,000	P 220	1.2 —1	2,900	7	14/-
Mullard	PM 2 B	2.0	0.2	150	3.0	4.2	3,000 5,000	0	14,000	PM 2 DX	1.5 —1	1,450	7	14/-
Six-Sixty	SS 220 B	2.0	0.2	150	2.0	5.2	1,830	0	8,000	SS 210 D	2.5 —1	1,250	7	14/-
362	BA 2	2.0	0.2	150	1.8	6.0	10,000	0	10,000	L 2	1.5 —1	1,500	7	9/-
	BX 2	2.0	0.4	150	3.0	10.0	6,000	0	7,000	LP 2	1—1	3,000	7	9/-
Triotron	E 220 B	2.0	0.3	150	3.0	7.0	6,500	0	18,000	TD 2	1—1.5	1,350	7	10/6
Tungsram	CB 220	2.0	0.2	150	2.5	7.0	4,000	0	16,000	LP 220	1.5 —1	2,000	7	11/-
	PX 46 P‡	2.0	0.3	400	14.0	108.0	900	0	5,800	AP 495	2—1	21,000	5	14/6
	DG 2018‡	20.0*	0.18	200	6.0	57.0	1,400	0	6 000	G 2018	2—1	7,000	5	17/-

‡ Characteristics for a pair of valves.

RECTIFYING VALVES

Type.		Filament.		Type of Rectification.	Max. Anode Volts. (R.M.S.)	Max. D.C. Output.		D.C. Output at Half Current.		Price.
		Volts.	Amps.			Volts.	mA.	Volts.	mA.	
Clarion	UF 4	4.0	1.0	Full-wave	250—0—250	240	60	275	30	10/6
Cossor	506 BU	4.0	1.0	Full-wave	250—0—250	230	60	270	30	12/6
	442 BU	4.0	2.5	Full-wave	350—0—350	350	120	400	60	15/-
	460 BU	4.0	2.5	Full-wave	500—0—500	520	120	600	60	20/-
Dario	FW 1	4.0	1.0	Full-wave	250—0—250	245	60	280	30	9/-
	FW 2	4.0	1.0	Full-wave	350—0—350	320	120	370	60	11/-
	FW 3	4.0	2.0	Full-wave	500—0—500	500	120	570	60	14/-
Eta	D 3-50 B	4.0	0.7	Full-wave	300—0—300	300	50	380	25	10/-
	D 3-80 B	4.0	2.0	Full-wave	450—0—450	450	80	540	40	10/-
	D 5-125 B	4.0	2.1	Full-wave	500—0—500	500	125	750	65	15/-
	G 7-85	7.5	1.25	Half-wave	700	750	85	1,000	42	25/-
Ferranti	R 4	4.0	2.5	Full-wave	350—0—350	280	120	360	60	15/-
	R 4 A	4.0	2.5	Full-wave	500—0—500	525	120	620	60	20/-
Lissen	U 650	6.0	0.5	Half-wave	300	310	40	350	20	12/6
	UU 41	4.0	1.0	Full-wave	300—0—300	330	80	360	40	12/6
	U 16	16.0*	0.25	Half-wave	300	300	40	330	20	12/6

* Indirectly heated.

RECTIFYING VALVES—(*Continued*)

Type.		Filament.		Type of Rectification.	Max. Anode Volts. (R.M.S.)	Max. D.C. Output.		D.C. Output at Half Current.		Price.
		Volts.	Amps.			Volts.	mA.	Volts.	mA.	
Loewe	4 NG	4.0	0.7	Full-wave	300—0—300	250	80	275	40	9/6
	8 NG	2.5	1.0	Full-wave	300—0—300	210	80	265	40	9/6
	10 NG	4.0	0.25	Half-wave	300	280	30	310	15	8/–
	12 NG	4.0	0.25	Full-wave	300—0—300	275	30	285	15	8/6
Marconi and Osram	U 10	4.0	1.0	Full-wave	250—0—250	260	60	300	30	12/6
	U 12	4.0	2.5	Full-wave	350—0—350	325	120	380	60	15/–
	U 14	4.0	2.5	Full-wave	500—0—500	540	120	620	60	20/–
	MU 12	4.0*	2.5	Full-wave	350—0—350	340	120	410	60	15/–
	MU 14	4.0*	2.5	Full-wave	500—0—500	540	120	600	60	20/–
	GU 1	4.0	3.0	Half-wave Mercury Vapour.	1,000	1,100	250	1,150	125	25/–
Mazda	UU 2	4.0*	1.0	Full-wave	250—0—250	220	60	260	30	12/6
	UU 60 250	4.0*	2.0	Full-wave	250—0—250	255	60	290	30	12/6
	UU 120 350	4.0	2.5	Full-wave	350—0—350	355	120	380	60	15/–
	UU 120 500	4.0	2.5	Full-wave	500—0—500	575	120	610	60	20/–
Micromesh	R 1	4.0*	1.0	Full-wave	250—0—250	260	60	290	30	12/6
	R 2	4.0*	2.25	Full-wave	350—0—350	360	120	410	60	15/–
	R 3	4.0*	2.25	Full-wave	500—0—500	610	120	640	60	20/–
Mullard	DW/2	4.0	1.0	Full-wave	250—0—250	250	60	280	30	12/6
	DW/3	4.0	2.0	Full-wave	350—0—350	320	120	370	60	15/–
	DW/4	4.0	2.0	Full-wave	500—0—500	500	120	550	60	20/–
	IW/2	4.0*	1.2	Full-wave	250—0—250	250	60	260	30	12/6
	IW/3	4.0*	2.4	Full-wave	350—0—350	350	120	400	60	15/–
	DW/6	4.0	4.0	Full-wave	1,000—0—1,000	1,100	150	1,200	75	60/–
Ostar-Ganz	EG 50	250 max.*	0.024	Half-wave	—	—	50	—	—	12/6
	EG 100	250 max.*	0.024	Half-wave	—	—	125	—	—	14/9
	XG 40	100/150*	0.044	Voltage Doubler	—	—	40	—	—	22/9
	XG 100	100/150*	0.044	Voltage Doubler	—	—	100	—	—	24/–
	VG 45	150/250*	0.044	Full-wave	—	—	45	—	—	28/9
Pix	40 250	4.0	0.6	Full-wave	250—0—250	230	40	260	20	8/6
	500	4.0	1.0	Full-wave	350—0—350	320	60	370	30	10/6
	120 500	4.0	2.0	Full-wave	500—0—500	500	120	570	60	15/6
Philips	1821	4.0	1.0	Full-wave	250—0—250	250	60	280	30	12/6
	1807	4.0	2.0	Full-wave	350—0—350	350	120	370	60	15/–
	1561	4.0	2.0	Full-wave	500—0—500	500	120	560	60	20/–
	1881 A	4.0*	2.4	Full-wave	250—0—250	250	60	—	—	12/6
	1867	4.0*	2.4	Full-wave	350—0—350	350	120	—	—	15/–
	1861	4.0*	2.4	Full-wave	500—0—500	500	120	—	—	20/–
Six-Sixty	SS W 462	4.0	1.0	Full-wave	250—0—250	250	60	280	30	12/6
	SS W 120/350	4.0	2.0	Full-wave	350—0—350	350	120	370	60	15/–
	SS W 120 500	4.0	2.0	Full-wave	500—0—500	500	120	550	60	20/–
	SS IH 60/250	4.0*	1.2	Full-wave	250—0—250	250	60	270	30	12/6
	SS IH 120/350	4.0*	2.4	Full-wave	350—0—350	350	120	400	60	15/–
Triotron	G 470	4.0	1.0	Full-wave	350—0—350	325	75	385	35	7/6
	G 4120	4.0	2.0	Full-wave	500—0—500	500	120	575	60	12/6
	G 4100	4.0	2.0	Half-wave	750	775	100	850	50	14/6
	G 4150	4.0	3.0	Half-wave	750	775	150	845	75	48/–
Tungsram	APV 4200	4.0*	2.0	Full-wave	350—0—350	350	75	380	35	15/–
	PV 4200	4.0	2.0	Full-wave	500—0—500	470	125	550	62	15/–
	PVX 2800	5.0	2.0	Full-wave	300—0—300	270	125	320	62	8/–
	VX 2810	7.5	1.25	Half-wave	750	650	110	740	55	17/6
	V 2018	20.0*	0.18	Half-wave	250	250	70	270	35	10/–
	PV 4018	40.0*	0.18	Full-wave	350—0—350	340	120	380	60	10/6

* Indirectly heated.

METAL RECTIFIERS

Type.		Capacity (mfd.) of Voltage Doubling Condensers, 50 Cycles Mains.	Peak Voltage Rating of Condensers (Working).	Type of Rectifier.	Max. Input Voltage R.M.S.	Maximum D.C. Output Unsmoothed.		Half-Current Output.		Price.
						Volts.	mA.	Volts.	mA.	
Westinghouse	H.T. 5 ..	4 + 4	200	Full-wave, Voltage Doubler	80	140	20	165	10	12/6
	H.T. 8 ..	4 + 4	350	Full-wave, Voltage Doubler	200	280	60	440	30	18/6
	H.T. 9 ..	4 + 4	400	Full-wave, Voltage Doubler	240	330	60	515	30	21/–
	H.T. 10 ..	8 + 8	250	Full-wave, Voltage Doubler	150	225	100	350	50	21/–
	H.T. 11 ..	6 + 6	500	Full-wave, Voltage Doubler	300	460	150	620	75	35/–
	H.T. 12 ..	4 + 4	200	Full-wave, Voltage Doubler	140	280	30	315	15	17/6
	H.T. 13 ..	8 mfd. Reservoir	350	Half-wave	150	150	25	170	12	17/6

MISCELLANEOUS

Type.		Filament.		Max. Anode Volts.	A.C. Resistance (Ohms).	Mutual Conductance (mA/V.)	Base.	Price.	Remarks.
		Volts.	Amps.						
Cossor	210 DG ..	2.0	0.1	100	27,000	0.19	5	20/–	Bi-Grid.
	41 MDG ..	4.0*	1.0	200	40,000	0.25	5	19/–	Bi-Grid.
	S 130	—	—	—	—	—	—	—	Neon Voltage Stabiliser.
Ediswan	CR 2	2.0	1.5	1,000	—	—	4	15/–	Special Diode Rectifier.
Ferranti	VHT 4.. ..	4.0*	1.0	200	Screen Volts=100	—	7	20/–	Heptode Frequency Changer.
Lissen	200/25 ..	—	—	—	—	—	4	—	Barretter Voltage Regulator for 0.25 amp. D.C. Valves.
Loewe	3 NFB.. ..	4.0	0.125	200	—	—	—	27/6	Triple Valve.
	3 NFW ..	4.0*	1.0	200	—	—	—	27/6	Triple Valve.
Marconi and Osram	DG 2	2.0	0.2	100	3,750	1.2	5	20/–	Bi-Grid.
Osram	Barretter 251..	—	—	—	—	—	4	12/6	Barretter Voltage Regulator for 0.25 amp. D.C. Valves.
Six-Sixty	SS 210 DG ..	2.0	0.1	80	12,500	0.8	5	20/–	Bi-Grid.
	SS 4 DG AC ..	4.0*	1.0	200	70,000	0.1	5	19/–	Bi-Grid.
Tungsram	DG 210 ..	2.0	0.12	100	5,000	1.0	4	15/–	Double-Grid.
	DG 4100 ..	4.0*	1.0	100	5,000	1.0	5	17/–	Double-Grid.
	DG 2018 ..	20.0*	0.18	100	5,000	1.0	5	17/–	Double-Grid.
	180 R	—	—	—	—	—	—	5/6	Barretter Voltage Regulator for 0.18 amp. D.C. Valves.

WESTECTORS

Type.		Max. Peak Input Voltage.	Max. Rect. Current (mA.).	Type of Rectifier.	Price.
Westinghouse.. ..	W. 4	24	0.25	Half-wave	7/6
	W. 6	36	0.25	Half-wave	7/6
	W. 24	24	0.5	Full-wave	10/6
	W. 26	36	0.5	Full-wave	10/6

* Indirectly heated.

CHARACTERISTICS OF 1933-1934 TYPES—*Concluded from page 4*

including a thermal delay switch in order to ease the strain on the smoothing condensers. The figures given for output assume in all cases the use of a 4 mfd. reservoir condenser and this should in general be rated for working at not less than 1.4 times the R.M.S. A.C. input voltage. Thus, the condenser used with a 500-volt rectifier should be rated for at least 700 volts working.

Metal Rectifiers

In the case of metal rectifiers, the data given is essentially the same as that for valves, but columns are included giving also the capacity and working voltage of the condensers to be included in the voltage doubling circuit. These capacities, it should be noted, are for 50 cycles mains, and where the supply is of different frequency they must be appropriately altered. With 100 cycles mains the condensers must each be of one-half the listed capacity and with 25 cycles double.

The Westectors are intended for detection and A.V.C. purposes, and they are analogous to a diode valve detector. They find their chief practical application in the second detector circuits of superheterodynes.

A glance through the following tables will show that no distinction has been made between A.C. and D.C. types of indirectly heated valve. Such a distinction is at best rather artificial, for it is perfectly practicable to operate the so-called D.C. valves from an A.C. supply, while A.C. valves may be used with complete satisfaction on direct current. In general, however, it may be taken that indirectly heated valves rated for 4 volts are intended by their makers for A.C. operation, and that all other voltages are primarily D.C. mains valves. In certain cases, notably the 20 volts and 250 volts types, A.C. or D.C. operation is a recognised feature of the design and they are strictly termed Universal types.

RELIABLE RECTIFIERS

When buying or building an A.C. Mains set or eliminator, give a thought to its most important component—the rectifier—on which the whole power supply depends.

See that it is a reliable rectifier . . . one that will not burn out or require periodical renewal . . . a rectifier that will not deteriorate, and which will last as long—and even longer—than the set itself . . . see that it is a WESTINGHOUSE METAL RECTIFIER.

HIGH TENSION				LOW TENSION				WESTECTORS				
Type	OUTPUT Volts	mA	Price	Type	OUTPUT Volts	Amps.	Price	Model	Type	H.F. Input (max.)	Max. Output	Price
H.T.5	120	20	12 6	L.T.2	6.0	0.5	11 -					
H.T.8	250	60	18 6	L.T.4	6.0	1.0	13/-	W.4	Half-wave	24 v.	0.25 mA	7/6
H.T.9	300	60	21 -	L.T.5	12.0	1.0	15/-	W.6	"	36 v.	0.25 mA	7/6
H.T.10	200	100	21/-	L.T.6	6.0	2.0	30/-	WM24	Full-wave	24-0-24	0.5 mA	10/-
H.T.11	500	120	35 -	A.4	9.0	2.0	39/6	WM26	"	36-0-36	0.5 mA	10/-
H.T.12	200	30	17 6	A.6	6.0	3.0	47/6					
H.T.13	150	25	17 6									

WESTINGHOUSE

METAL RECTIFIERS & WESTECTORS

Send 3d. in stamps to Dept. "V.D." for a copy of "The ALL METAL WAY 1934" containing full particulars and prices.

The Westinghouse Brake & Saxby Signal Co. Ltd.,
82, York Rd., King's Cross, London, N.1.

Ferranti use

FERRANTI VALVES

—so should YOU

Here are a few details of specification and construction which tell you why.

4-volt HEATERS will stand with full H.T. :—

10 volts momentarily, 9 volts for 30 seconds,
8 volts for 2 to 5 minutes, 6 volts indefinitely,

and, while the use of less than 4 volts is not recommended, the valves will operate down to 3 volts without change of characteristics.

Cathodes have separately fabricated insulators, with floating heater giving **MAXIMUM INSULATION** with **MINIMUM HEAT CAPACITY**, ensuring rapid heating, reduction in valve noise, and elimination of hum.

High heat-conductivity grids and Barium Getter result in valves with clear bulbs of unusually small dimensions, and Getter is active also in maintaining hardness of valves throughout their life.

H.F. Anodes of special material, Carbonised for Triodes and Rectifiers, specially rigid alloy support wires, and the most modern methods of construction, ensure compact assembly of electrodes.

CONSTRUCTION. The use of Mica end pieces gives accurate spacing of electrodes and rigidity of structure. Special selection of Mica and treatment by secret Ferranti process prevents electrical leakage and valve noise. Insulation between Cathode and Heater will withstand 150 volts continuously and breakdowns in Ferranti Valve Heaters are almost unkown. High Cathode temperature and relatively large clearances give uniformity of characteristics, long life, absence of microphony, with reasonably high mutual conductance.

The characteristics of Ferranti valves are given in this booklet. But remember the Ferranti Heptode (oscillator-modulator) is specially suitable for use in the "Wireless World" New Monodial Super.

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VALVES

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The Wireless World

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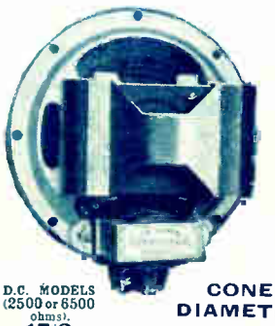

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CONE DIAMETER	OVERALL DIAMETER	DEPTH
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is your guarantee of **SATISFACTION**

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Special Models for McMichael, G.E.C., Philips and Peto-Scott short-wave receivers £9.10.0. Eddystone Model £8.5.0. Models also for Mavox, Scott Sessions and other short-wave receivers.

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★ THE ORIGINAL MACHINE for this purpose; first introduced 1924. ★ Generates pure D.C. ★ Takes only modest current. ★ Built to last.

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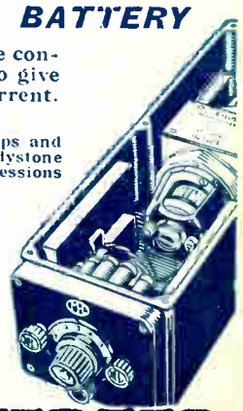

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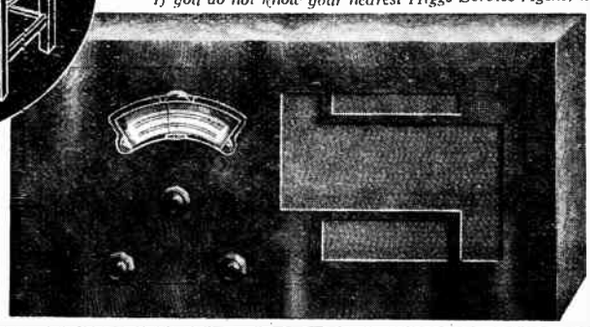
(Higgs' Chief Engineer)

Superhet selectivity marred by "mush"? Or fine quality reproduction with poor selectivity? The choice was forced upon you—until now! We wanted superhet selectivity with a degree of tone quality that a superhet couldn't reach. Sydney Leonard, our Chief Engineer, aided by Higgs' technical experts, has built such an instrument. A receiver using a tried and tested "straight" circuit brought right up to date, employing Iron Core Coils, H.F. and detector pentodes. This gives astonishing selectivity **and** sensitivity. Higgs **ultra modern straight radio** will pick up the most "difficult" stations—with amazing tone realism, unspoilt by background "burr." We ask you to hear a Higgs at home—and judge solely by results. *If you do not know your nearest Higgs Service Agent, write to us for his address.*



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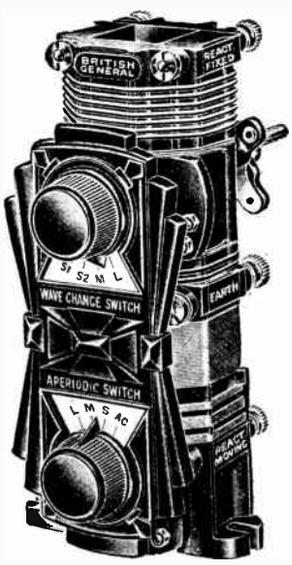

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SUPER INSULATED CELLS

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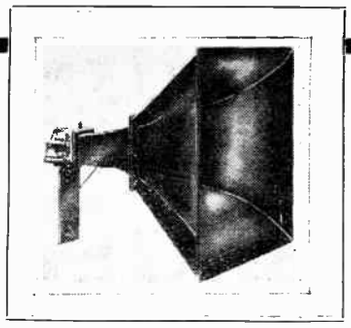

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LOUDSPEAKER

with 4-ft. mouth horn

Price, ex Works,

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Unit only . . £14 : 10

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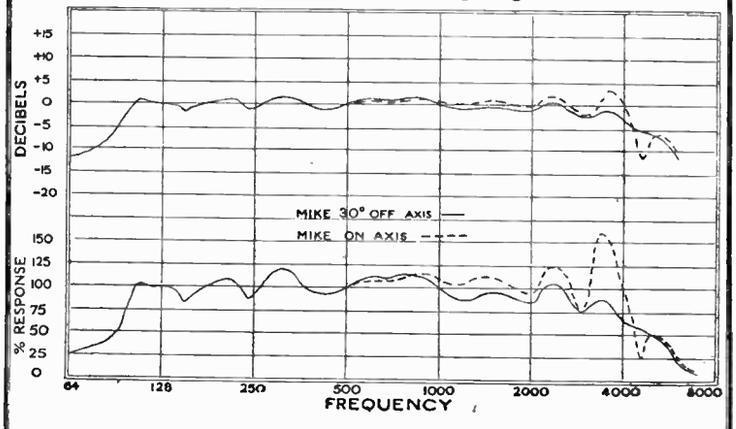
Price £15

Characteristic curve of Voigt loudspeaker with 4-foot horn and recent standard diaphragm.



Decibel Scale Ratio, 20 db. to 1 octave. 28-8-33.

The curve shown above was taken recently at Sydenham and explains better than words why the quality of *music and speech*, with the Voigt speaker, is so amazingly lifelike on a good transmission.

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Voigt Patents Limited announce that their apparatus for taking low frequency response curves has now been set up at their Laboratory at Sydenham. They are prepared to calibrate loudspeakers, pickups, etc., for manufacturers and amateurs.

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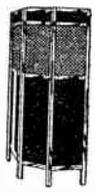

Domestic Model
Height . . 5′ 8″

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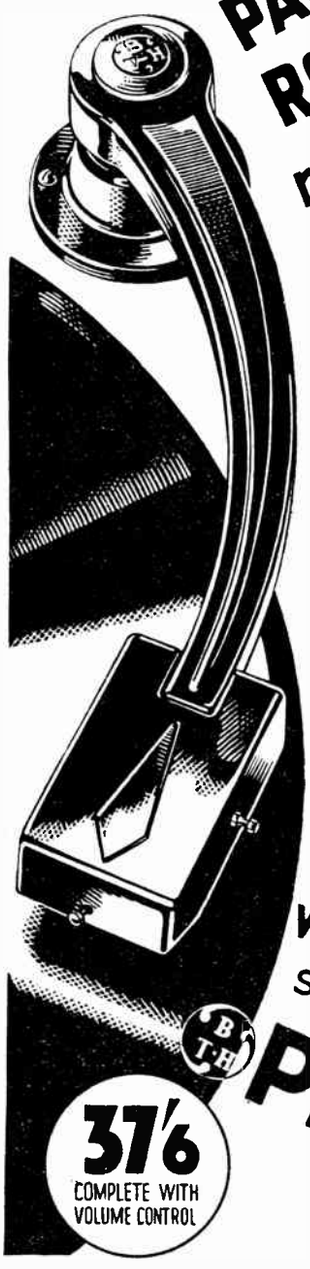

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The "Senior" model for the connoisseur—the "Minor" model at 21/- for the man wanting good reproduction at a reasonable cost.

with a B.T.H. SENIOR PICK-UP

37/6 COMPLETE WITH VOLUME CONTROL

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10 POWERFUL FEATURES

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2. Available for A.C. or D.C. Mains.
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7. Westinghouse Metal Rectification.
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10. PRICES FROM *or by Easy Payments* 37/6

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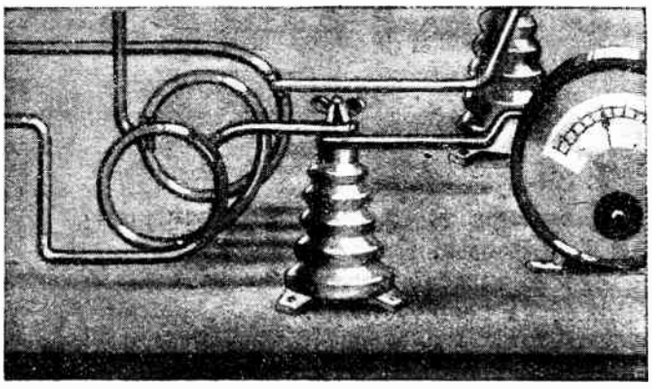
5 METRES



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FOR THE SELF EXCITED PUSH-PULL OSCILLATOR, THESE VALVES WILL GENERATE THE MAXIMUM HIGH FREQUENCY ENERGY.

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THESE VALVES WILL GIVE EXCELLENT RESULTS IN SUPER-REGENERATIVE RECEIVERS WHERE DETECTION AND QUENCHING OCCURS IN ONE VALVE. ALSO ADMIRABLE FOR QUENCHING ONLY.

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FOR USE AS DETECTOR WHEN SEPARATE QUENCHING VALVE (L.P.220) IS USED.

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The only complete FACTORY MATCHED Super-Het Tuning Unit

THE unit comprises CONSTANT AERIAL COUPLING coil, R.F. inter-valve coil and oscillator coil, special super-het 3 ganged condenser, the oscillator tuning section having "shaped" tracking vanes ensuring matching over the whole wave-band. The R.F. Super Radiopak is matched within ½ of 1 per cent. before despatch. One has only to balance out the stray circuit capacities with the aid of the trimmers conveniently provided at the top of the Unit to ensure permanent MATCHED PERFECTION.

A PADDING CONDENSER is incorporated to balance the tuning on the LONG WAVE-BAND. PRICE
SUITABLE FOR I.F. of 110 K.C.
The scale is calibrated in *Wavelengths.*
200-550 m. 800-2,000 m. **75/-**

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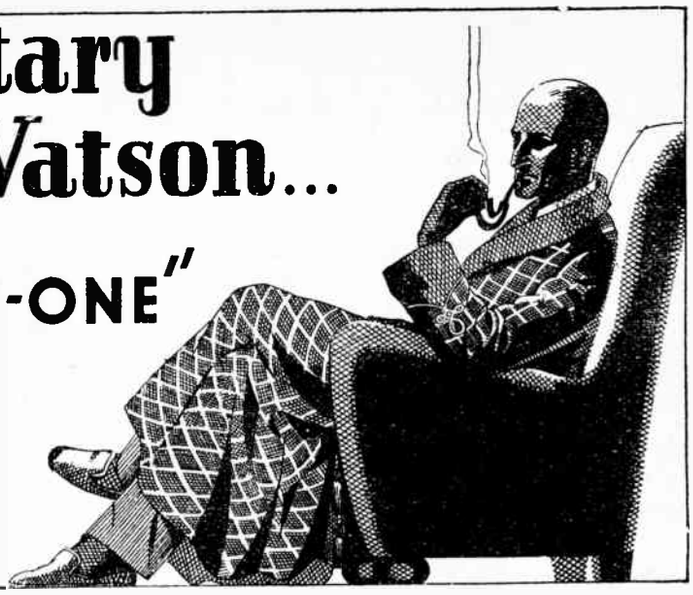
WITH AN ALL-IN-ONE"



Standard Model "All-in-One" Radiometer for Battery Sets only, as shown here.

Price **12/6**

De Luxe Model for Battery Sets, Electric Receivers and Mains Units.

Price

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"The invaluable assistance of an "All-in-One" Radiometer enabled me to track down the trouble with this radio set very quickly. The transformer was burnt out. If the fault had been anything else, however, I could have traced it just as easily and as quickly with this marvellous instrument to help me."

The "All-in-One" Radiometer well deserves its name—"The Sherlock Holmes of Radio." Every radio owner needs it, because by its aid he can be assured of perfect radio performance at all times. The "All-in-One" tests valves, circuit, batteries, condensers, transformers, and any other components, registering a verdict on each in a few moments.

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PIFCO ALL IN ONE RADIOMETER

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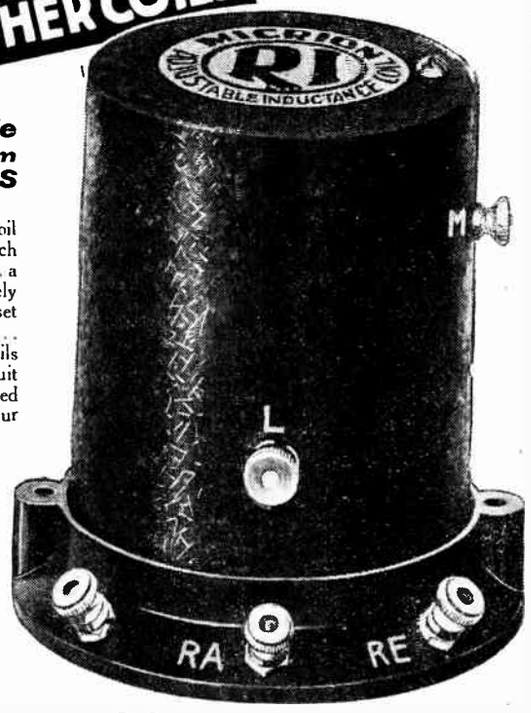
40% SUPERIOR BY COMPARISON with OTHER COILS

The Only DUST IRON COIL WITH *MICROMETER* ADJUSTABLE INDUCTANCE

(On both medium and long wavebands.)

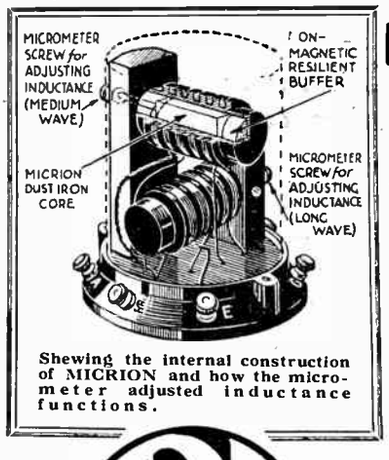


A Remarkable Test Report from the "WIRELESS WORLD"

The special feature of the coil is that the inductance of each section can be varied . . . . a ready means for accurately matching the coils in the set under working conditions . . . . enables air and Micrion coils to be used in the same circuit and their inductances matched for single dial tuning. Our tests show the coil to be **a particularly efficient one,** and definitely better than a first grade air coil of the familiar screened pattern. Compared on a basis of dynamic resistance values, **the Micrion coil is about 40% better on the medium waveband and of the order of 30% on the long waves.**

(Oct. 27th, 1933).

The chaotic state of wavelengths and the difficulties of reception under present broadcasting conditions have emphasized the need for vast improvement in the tuning systems of most receivers to-day.



Shewing the internal construction of MICRION and how the micrometer adjusted inductance functions.

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an entirely new system, **gives every receiver knife-edged selectivity and greatly increased range.** It makes the advent of the "Micrion" Coil a milestone in the progress of radio development. It is the outstanding achievement of 1933-34.

The great feature of the "Micrion" Coil is that the position of the cores within their respective bobbins may be altered and so **enable the coils to be accurately matched within the receiver under working conditions.** It also permits air and "Micrion" Coils to be used in the same circuit with **single dial tuning.** Further, in most receivers the "Micrion" Coil can be substituted for the existing coils **without costly and difficult alterations to the circuit and without changing the calibration readings.**

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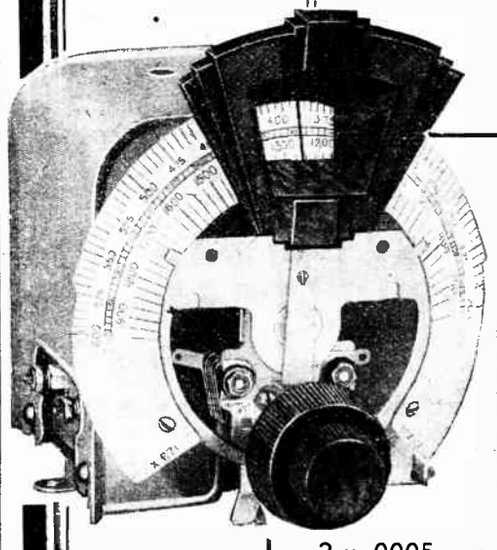

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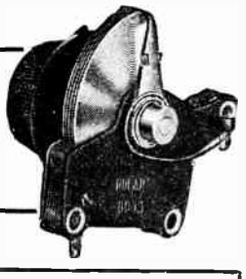

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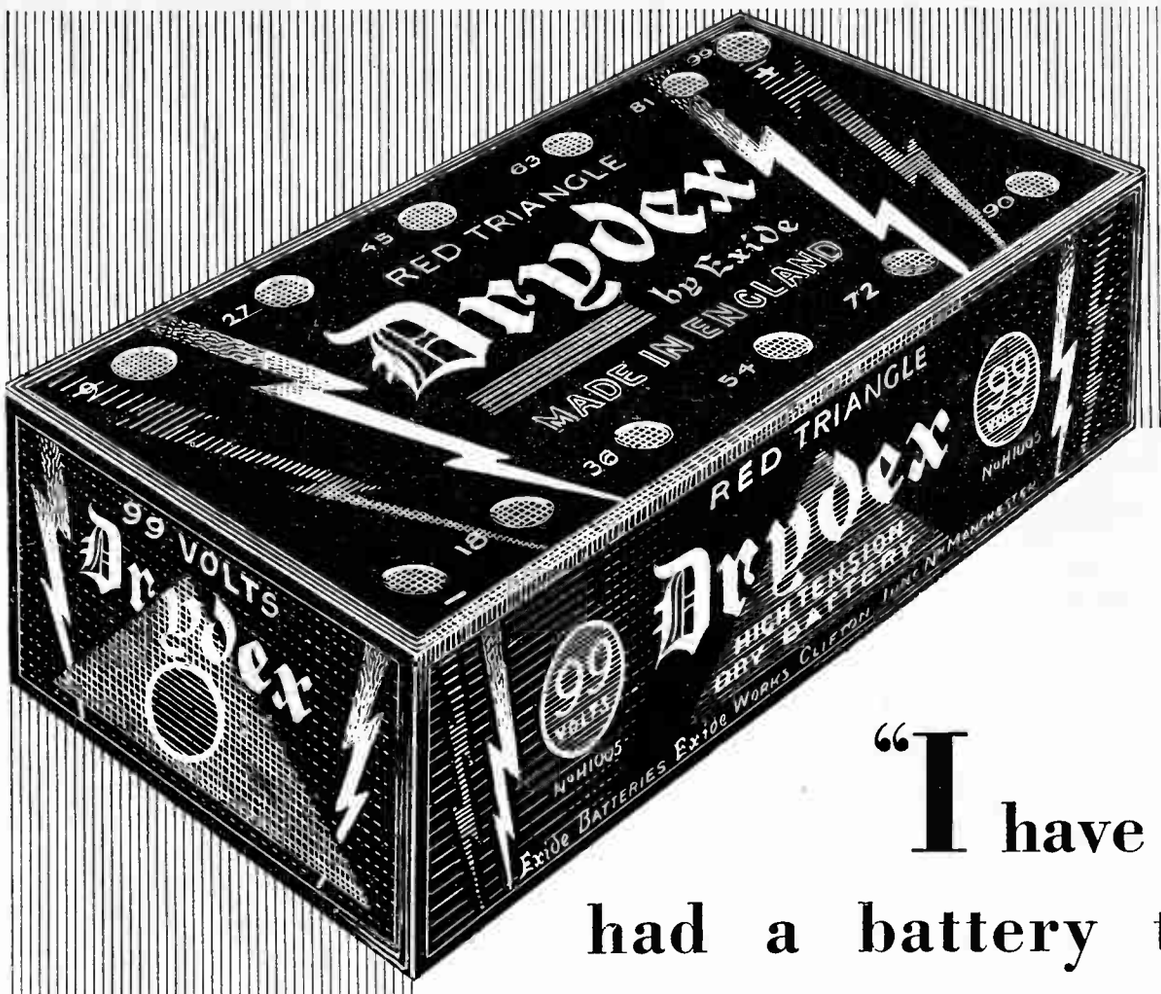

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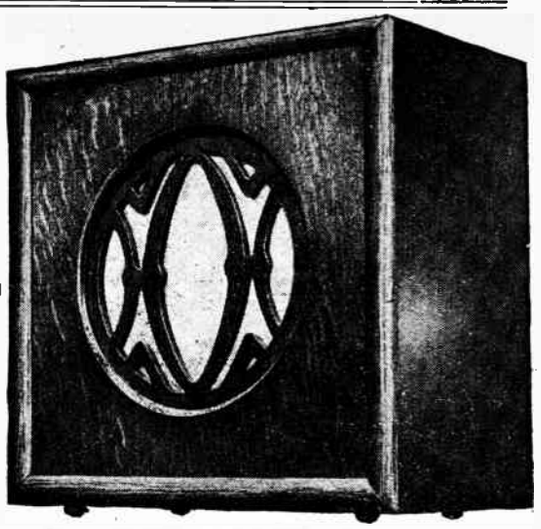

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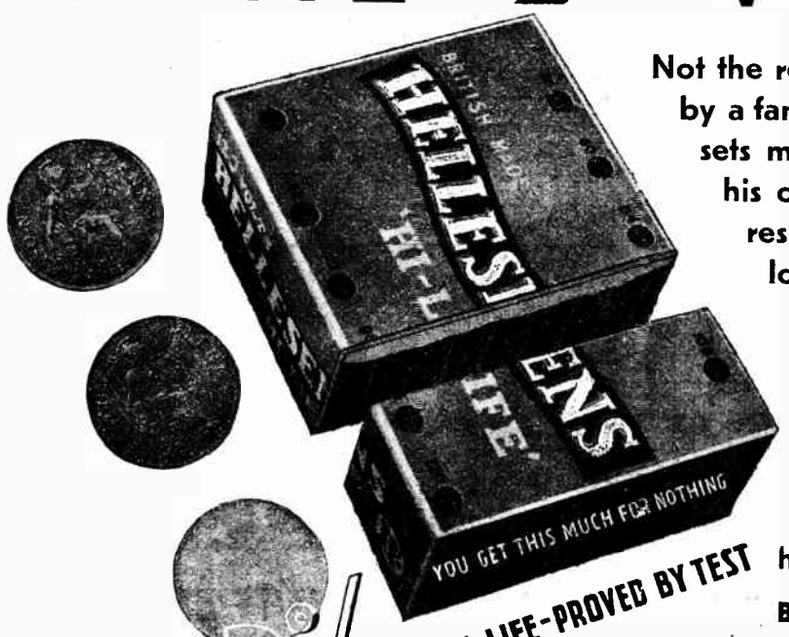

Not the result of our own test, but the result of a test by a famous British set-maker. A bad battery in his sets might ruin his reputation, so before placing his order, he put Hi-life batteries on test. The result showed their life was no less than 50·2% longer than their nearest competitor. This test, made with the identical batteries that you buy, means that you get 50·2% more life, 50·2% greater power, 50·2% higher capacity free. And you get the same high standard of quality and constant performance for which Hellesens have been famed for over 40 years.

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It means that it will operate a moving coil speaker with plenty of volume from a pick-up *without an intermediate amplifying stage.

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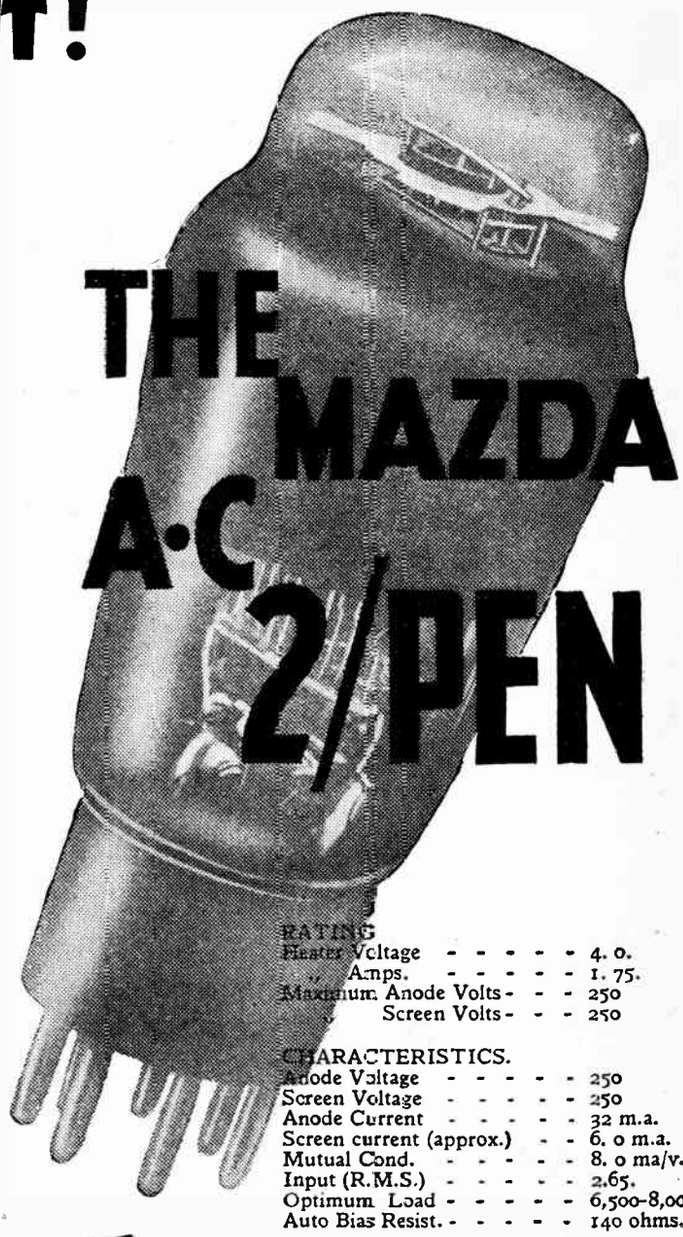
Your dealer has these valves in stock and can give you further details, or you can write to the Valve Service Department who will be pleased to send you full information and circuit diagrams.

Price 18/6. Standard 7 Pin Base.



RATING
Heater Voltage - - - - - - 4. 0.
,, Amps. - - - - - - 1. 75.
Maximum Anode Volts - - - 250
Screen Volts - - - 250

CHARACTERISTICS.
Anode Voltage - - - - - - 250
Screen Voltage - - - - - - 250
Anode Current - - - - - - 32 m.a.
Screen current (approx.) - - 6. 0 m.a.
Mutual Cond. - - - - - - 8. 0 ma/v.
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Optimum Load - - - - - - 6,500-8,000
Auto Bias Resist. - - - - - 140 ohms.

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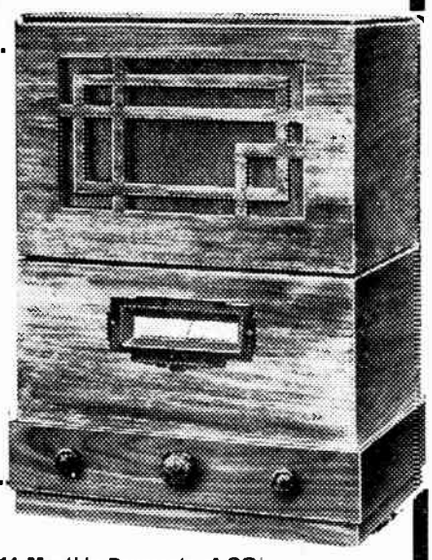

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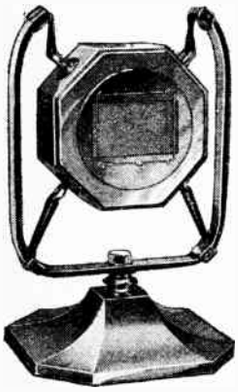

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Dearer, perhaps, but the difference in cost is lost in the amazing QUALITY performance of this outstanding pick-up. To ears long accustomed to electrical reproduction it brings a new thrill; to the most critical it brings true satisfaction. Here is a pick-up designed from the very beginning to achieve perfection, and in gaining its object the BOWYER-LOWE MARK IV Pick-up has won unstinted praise everywhere. This is the pick-up to use if you value QUALITY.

Matched Response Pick-up (rotating head) with swivel arm on ball bearings, base and support. In Florentine bronze and brown Bakelite to match **42/-**

In cases of difficulty apply direct with name of your usual Dealer. Also for Lists.

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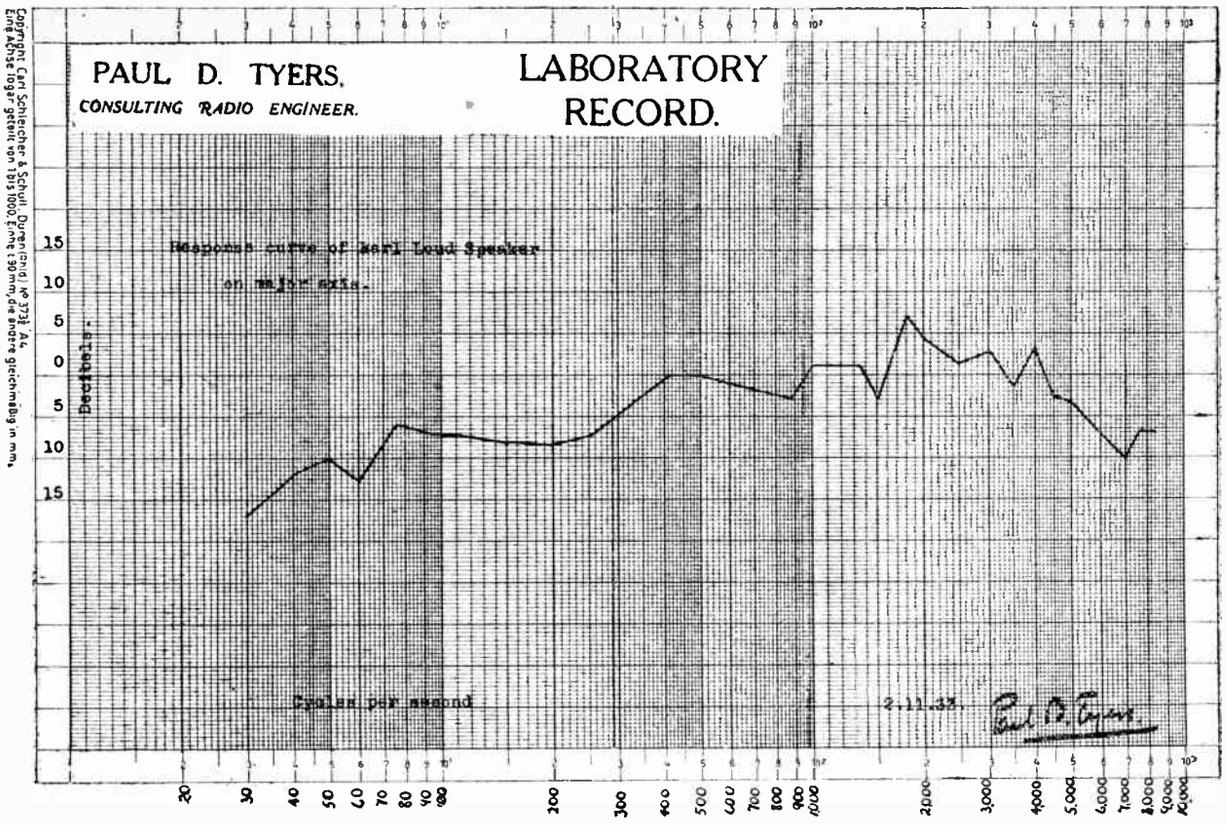

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A CLOSE inspection of the above curve reveals three things:—

(a) That there is no 100 cycle peak, thus rendering it eminently suitable for humfree use with all mains sets.

(b) The almost negligible peak at about 2,000 cycles . . . of prime importance where a pickup is to be used.

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Two of the reasons for such an excellent curve will be seen in Fig. 1, which shows the marked radius at the neck of the cone, and in Fig. 2, which shows how the cone floats freely between the two felt rings.

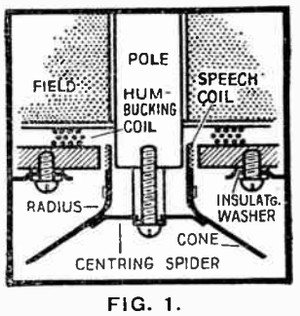

FIG. 1.

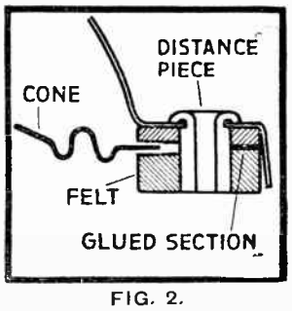

FIG. 2.

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PERMANENT MAGNET from **32/6**

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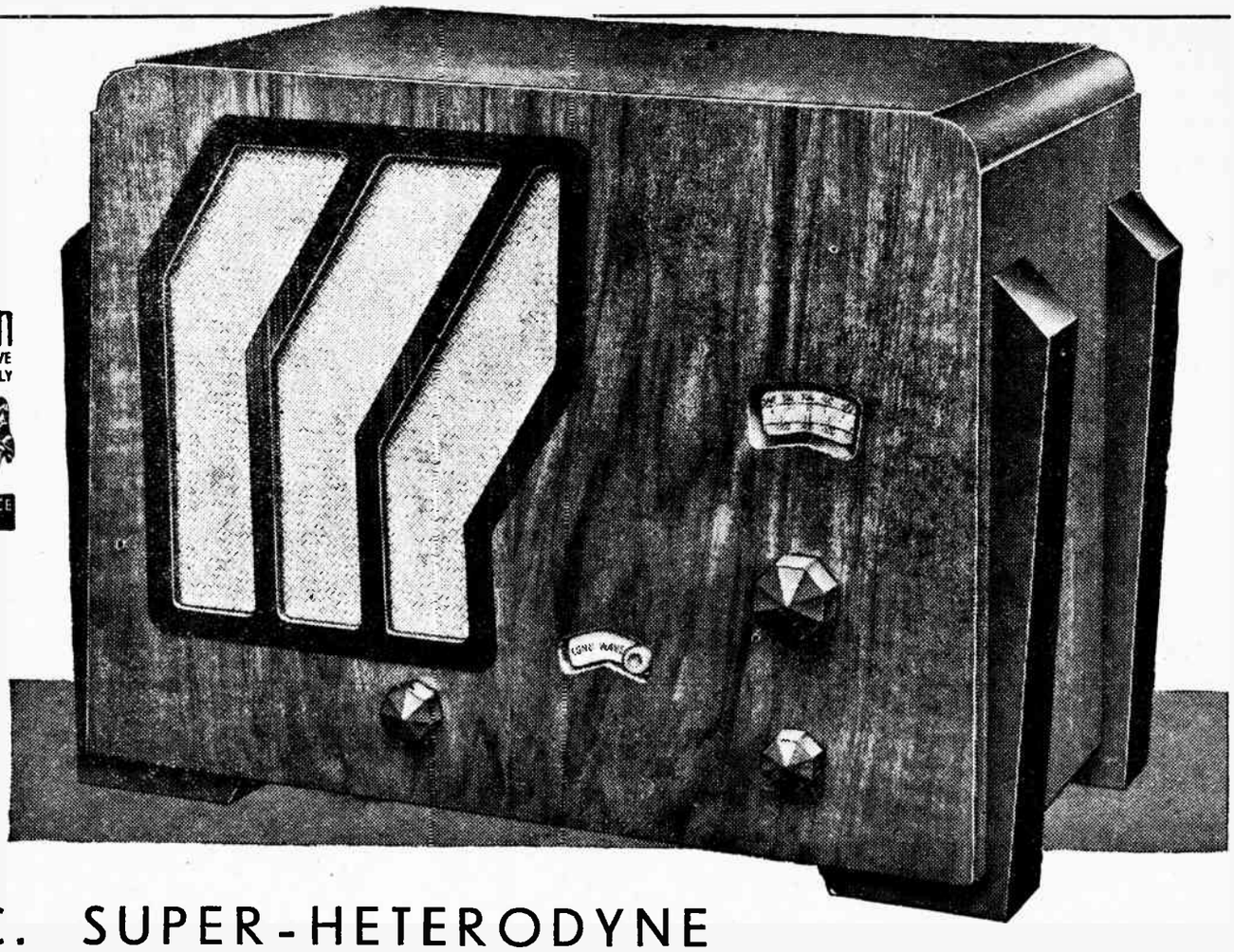

- A.C. SUPER-HETERODYNE
- SIX VALVES (including Rectifier)
- ENERGISED M.C. SPEAKER

Utilising no less than seven tuned stages, controlled by a single illuminated dial (wavelength-calibrated), this handsome Cossor All-Electric Super-het gives a really remarkable performance. It is capable of bringing in every worth-while European station at programme strength, free from local interference. And, due to its specially designed output stage and energised M.C. Speaker, its reproduction is of that superlative quality usually associated only with receivers of much higher price.

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Receiver as illustrated, complete with six Cossor Valves, viz.: MVS/PEN (Met.) Detector, MVS/PEN (Met.) I.F. Amplifier, 41 MP. Oscillator, MSG/HA (Met.) Second Detector (Anode Bend), MP/PEN Pentode Output and 442 BU Rectifier Valves. The latest type Mains Energised Moving Coil Loudspeaker. Illuminated single dial tuning, calibrated in wavelengths (200/570 and 1,000/2,000 metres), combined volume control and on-off switch. Tone control. Handsome walnut-finished cabinet 13" high, 18" wide, 11½" deep, complete with pick-up plug and socket. Mains aerial. Sockets for additional Loud Speaker. For A.C. Mains only, 200/250 volts (adjustable), 40-100 cycles.

PRICE

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Prices do not apply in I.F.S.

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SUPER-HETERODYNE
RECEIVER

ALL ELECTRIC MODEL 635

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The Wireless World

THE PRACTICAL RADIO JOURNAL
23rd Year of Publication

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As many of the circuits and apparatus described in these pages are covered by patents, readers are advised, before making use of them, to satisfy themselves that they would not be infringing patents.

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EDITORIAL COMMENT

Cabinet Design

Housing the Wireless Set

AN article in this issue discusses the question of the outward form of the wireless receiver, and the author raises a number of points which should provide food for thought for those who are responsible for the containers for our wireless sets. Our author has, we think, been very restrained in his criticisms of the various methods of tackling this problem as illustrated in examples of current models. The truth is that no satisfying solution to the problem of housing a wireless set has yet been evolved, and here we are not levelling criticism at the efforts of any designer in particular, for all types are unsatisfactory, though a few are better than the rest. Is it reasonable to expect a designer to set out to try to meet public taste when the public is at present divided into at least three distinct classes as regards their views on what a wireless container should be?

First, there are those who consider that a wireless set should not appear in a living room at all; that the speaker should be somewhere cunningly concealed from view and the set preferably installed elsewhere and operated entirely by remote control. Secondly, we have a very large class of wireless user which considers that the set should be camouflaged by accommodating it in some existing example of furniture which harmonises with the period or general style of furnishing of the room in which it is to be used; and, thirdly, there are those who suggest that the set should be a wireless set with its own individuality evolved to meet its own particular function, just as the piano, the harp, the violin, and the clock have been evolved with no attempt at camouflage.

As we have pointed out in recent editorial comment, one of the weakest points in design is the difficulty experienced on nearly every type of set in tuning. There appears to be a conspiracy on the part of designers to make the tuning device as inconspicuous as possible, and nearly always most inconveniently located.

There is so much scope for originality on this question of housing the receiver that we feel it is a matter in which our readers might like to interest themselves by sending to us suggestions or rough sketches of what they would regard as the ideal arrangement. We would suggest that if readers will do this they should first of all try to forget present designs entirely and evolve some original scheme of their own. We would then be prepared to have these sketches properly drawn up and illustrated in a future issue, so that readers could compare their respective efforts and make a further selection from amongst the designs illustrated.

Television

No Great Expectations Yet

RUMOURS are still circulating to the effect that the 30-line Baird transmissions now put out by the B.B.C. (mostly at times other than those scheduled in the programmes!) are to cease with the termination of the present contract in the spring. It is also rumoured that these transmissions will be replaced by a vastly superior short-wave television service.

These stories should not be taken too seriously. The short-wave transmissions cannot be expected to give a service at present, and will at first be only experimental. If a television *service* is to be maintained, it will be by continuing transmissions along existing lines for the present.

The Receiver in Outward Form

Can We Improve Upon the Conventional Layout?

By H. F. SMITH

Photo.: Maurice Beck.

This Kolster-Brandes console cabinet, designed by Betty Joel, expresses modern tendencies in artistic design.

IN a recent speech, the Editor of *The Cabinet Maker* expressed the view that the broadcast receiver would, like all other utility articles, eventually assume the most suitable and convenient outward form through a gradual process of evolution. He was probably right, but evolution may be speeded up, and by taking thought it may be ensured that it proceeds along the most promising lines.

Before the public forms a definite preconceived idea as to what a receiver should look like, it would be as well to make sure that the accepted external design is really right. Unless we do so quickly, the time will soon come when any innovation, however good, will be regarded with prejudice and suspicion.

Basically, almost all broadcast sets are the same externally. The outside container is a box of more or less rectangular form, with a large and partially concealed hole for the loud speaker and three or four projecting knobs in front. Boxes for radio-gramophones and consoles are bigger, and are mounted on legs; occasionally the former outfit has the control panel mounted horizontally under the lid.

It must be conceded that the typical radio-gramophone, especially in the smaller sizes, is from many points of view a very unhandy instrument, and there must surely be scope for a designer with entirely unconventional ideas. Most radio-gramophones are fitted with a highly sensitive receiver chassis, so presumably they are often used for long-distance reception; again, they need fairly critical adjustment, or why should visual tuning indicators so often be fitted? The user should, therefore, be able to make adjustments in comfort.

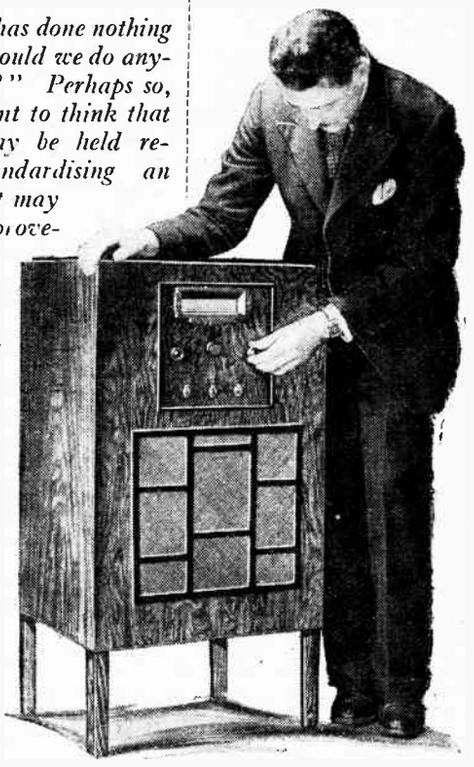
To operate many of the "knobs-in-front" radio-gramophones in a standing position, one should really not be much more than four feet nothing in height, otherwise the knobs cannot be reached and the tuning scale cannot be read without stooping. To sit down to the job is equally awkward, as there is no space for one's knees, especially in an easy chair.

"POSTERITY has done nothing for us; why should we do anything for posterity?" Perhaps so, but it is not pleasant to think that our generation may be held responsible for standardising an external design that may be susceptible to improvement both functionally and artistically.

Sitting Down or Standing Up?

With knobs and tuning scale on top, it is easy enough to operate the set standing up, but, in the writer's experience, everyone prefers to sit down during a distant-reception *séance*—it seems the natural thing to do.

Most table models are also open to criticism on the score of convenience. Seldom are the control knobs at a suitable height, and even if they are, the position of the user's forearms, with bent wrists and strained arm muscles, is far from comfortable. A great improvement in this respect can be made by mounting the control knobs at the sides of the cabinet; with this arrangement one's forearms rest comfortably on the table, there is no wrist-twisting, and the most critical adjustments may be made for long periods without fatigue. Of course, the tuning scale, tuning indicator, and preferably a wave-range indicator, would remain in front. This is not a new idea: side knobs were fitted in early Philips and Regentone receivers, and the tuning control of the Lissen car set is installed in a comparable manner.



Worse than gardening! This user of a typical radio-gramophone is of average height, but he has to stoop.

A radical departure from convention: the Ferranti chair-side receiver-*cum*-bookcase is an example of successful originality.

Slaves to Fashion

So far as externals are concerned, most designers seem quite content to follow the example of "the best people," merely expressing their individuality by a symbolical loud speaker fret. The only basically "non-standard" British receiver seems to be the Ferranti "Gloria Companionette," which may be described as an armchair-side receiver, clearly designed to appeal to the type of user who regards his set as a means of relaxation for leisure hours. Without suggesting that the de-

The Receiver in Outward Form—

sign would suit everyone, it is at least eminently practical and works well. The set is very easy to tune from an armchair of the right height, and, indeed, is the only one that can be so operated in comfort.

It has been suggested editorially in *The Wireless World* that we might often revert to the plan of separating set and speaker. To do so would make it easier to satisfy the public demand for small sets. In America, whence so many of our ideas in radio are supposed to come, this alteration is being seriously considered.

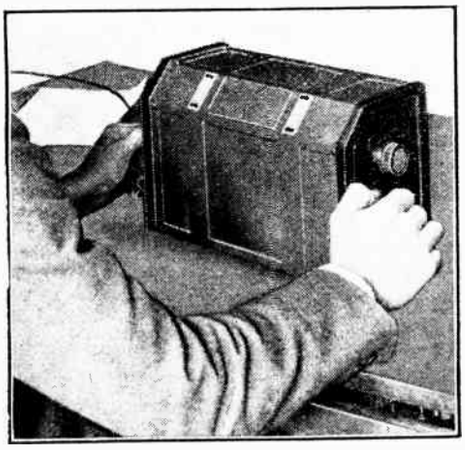
Engineer and Artist as Partners

All this has been written from the "functional" point of view, but it is not denied that the set of the future must be pleasing to the eye as well. But the older traditions of ornateness are quite out of keeping with the broadcast receiver, and even the modernist designer can sometimes be every bit as vulgar as his Victorian prototype. The only difference is that he favours meaningless and useless ornamentation of quite a different type. The whole subject is one that calls for close co-operation between the technician and the artistic designer who is in sympathy with modern ideas.

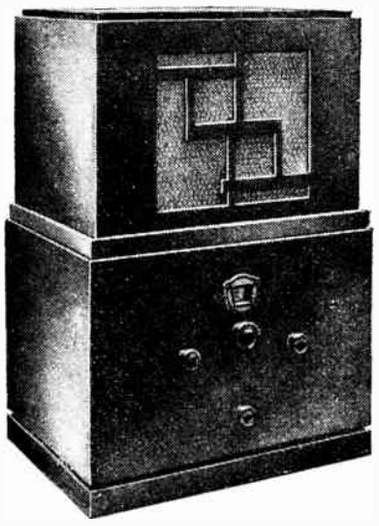
The Artist-Designer's Point of View

In the preceding article, our contributor has concerned himself hardly at all with aesthetic considerations, or the question of design purely from the artistic point of view. From these aspects his conclusions will be supplemented by those of prominent designers of cabinets for well-known radio manufacturers, who have very kindly expressed their views to "The Wireless World."

FOR the cabinet-work of their new "de luxe" superheterodyne, Kolster-Brandes wisely decided to take an outside opinion; we wireless people are apt to become set in our ideas on what we regard as non-essentials. They called upon the services of Betty Joel, who, with her husband, Commander David Joel, directs the activities of Betty Joel, Ltd., the well-known designers and makers of modern furniture.



An early type of receiver with side knobs, allowing a natural and comfortable operating position.



A two-unit C.A.C. receiver: the loud speaker is self-contained, and may be moved to any desired position.

It might be expected that her attitude towards the radio art would be mildly antagonistic, or at best that she would regard all mechanical contrivances as necessary evils. But Betty Joel is not at all like the layman's idea of an "arty" person; she is prepared to look upon a beautifully designed machine as an object of delight; certainly nothing to be camouflaged or hidden. No attempts to make the wireless set look like anything else are tolerated, and her ideals are the same for broadcast sets as for furniture.

To achieve beauty by line, form and proportion, and by the natural attractiveness of wood, rather than by ornament.

To try hard to eliminate all non-essentials, and never to put anything into a design just to make it more amusing or different.

Commander Joel's experience of the technical aspects of wireless goes back to the early days of the war, but he prefers not to commit himself on the question of possible basic improvements in outward form. So far, the job has been to devise a cabinet for a receiver of conventional layout, but both he and Mrs. Joel would welcome anything that makes the set of to-morrow more convenient and suitable for its function.

ALTHOUGH Mr. W. N. Duffy, who designs the Ferranti cabinets, is responsible for the solitary British receiver of truly original layout, he does not of necessity think that there is very much wrong with cabinets planned on conventional lines. But large manufacturers should produce a sufficient range of models to cater for varying tastes and needs.

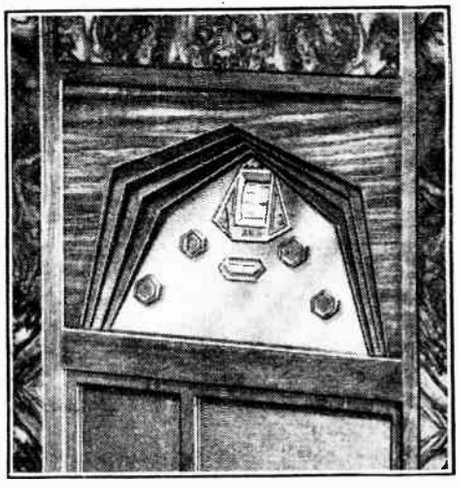
Mr. Duffy is a man of definite and clear-cut ideas; he holds that sets must be functionally as perfect as they can be made, and he is most emphatic in condemning attempts at disguise.

That the broadcast receiver will eventually become smaller is another of his convictions, but he is willing to admit that, in order to obtain efficiency, coupled with good reproduction and extreme compactness, it may be necessary to separate set and speaker.

In Mr. Duffy's view, there is no more suitable material than wood for radio cabinets, and he admits a personal distaste for the modern horizontal type of container, which, he points out, occupies much more table space than the upright table set.

Finally, he considers that no designer should succumb to the temptation to make a set merely look attractive in the dealer's showroom or on an exhibition stand; he proved very successfully that the designs for which he is responsible gained in attractiveness when they were placed amid ordinary domestic surroundings.

MR. RICHARD RUSSELL is a member of the firm of Gordon Russell, which both designs and manufactures the cabinets for Murphy sets, and has exerted a considerable influence both in the spheres of radio and furniture. His expressed views on the question of broadcast receivers are mainly concerned with the future; being a staunch supporter of built-in furniture (as part of the permanent structure of the house), he thinks that the wireless set will probably be similarly accommodated. Remote control is a possible development, and one that would solve a good many problems.



Improving the radio-gramophone. The inclined control panel of R.G.D. sets makes for easier operation.

The awkwardness of the present-day radio-gramophone is admitted, and, so far as the reproduction of records is concerned, he thinks that the best solution of the problem will be afforded by a kind of chair-side playing desk, which might be connected to a more or less distant receiver-amplifier.

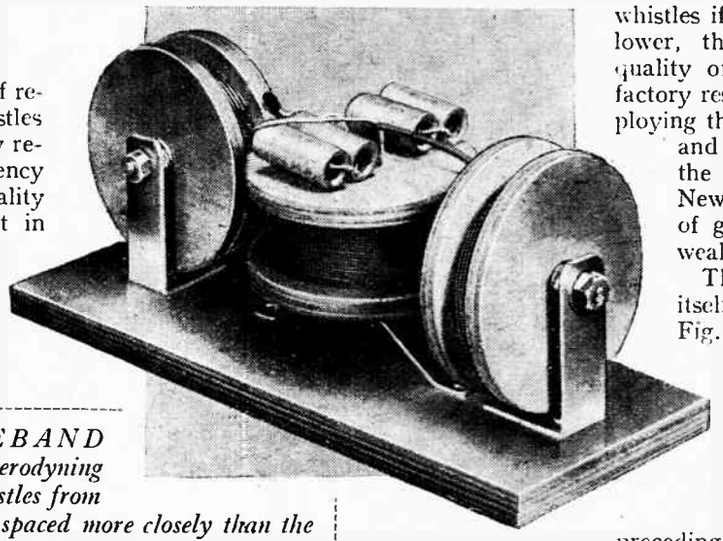
Although Mr. Russell is almost solely concerned with wood as a material, he is by no means certain that other substances, even including metal, may not eventually be preferred for cabinet construction.

Building a Whistle Filter

Eliminating Heterodyne Whistles and Sideband Splash

By W. T. COCKING

THE only known method of removing heterodyne whistles and sideband splash is by restricting the high frequency response of the receiver. The quality of reproduction thus suffers, but in many cases the net result is preferable to normal quality with a background of whistles, so that the method is not to be despised. It is a common experiment to try connecting a large capacity by-pass condenser across the loud speaker or an L.F. intervalve coupling in order to eliminate whistles, and many sets include a switch whereby such a condenser may be connected in circuit at will. Such an arrangement, however, is not very satisfactory, for if the condenser be large enough to remove the whistle, in most cases the quality of reproduction will suffer greatly.



A general view of the filter, showing the arrangement of the parts.

SIDEBAND heterodyning and whistles from stations spaced more closely than the standard 9 kc/s are all too common in distant reception. They may readily be eliminated by the use of a filter, however, and a special design is described in this article.

With such a simple circuit, a large degree of attenuation at the whistle frequency cannot be obtained without severely restricting the amplification of much lower frequencies. Thus, a condenser sufficiently large to remove a whistle even as high as 9,000 cycles will often greatly reduce the response at a frequency as low as 3,000 cycles, while to remove a 5,000 cycles whistle by this means leads to an almost total absence of high frequencies.

The only entirely satisfactory remedy is to employ a correctly designed and terminated low-pass filter, and several filter stages are necessary. Experiment has shown that if frequencies up to 3,500 cycles are fully reproduced and all higher frequencies are greatly attenuated, whistles higher in frequency than about 4,500 cycles are inaudible. This meets most practical requirements, since sideband splash normally consists of frequencies above 4,500 cycles, and most steady heterodyne whistles are also above this frequency.

The filter used, however, must cut-off very sharply at 3,500 cycles, otherwise the attenuation at higher frequencies will not suffice. A simple filter, therefore, is unsatisfactory, and it will only eliminate whistles if the cut-off frequency be made lower, thus unnecessarily harming the quality of reproduction. Entirely satisfactory results have been obtained by employing the filter described in this article, and a similar type was included in the design of *The Wireless World* New Monodial Super[1], and proved of great aid in the reception of the weaker continental stations.

The circuit diagram of the filter itself is shown by the heavy lines of Fig. 1, and it will be seen to consist of three inductances and four capacities. The connections to the receiver are shown by the shaded portion of the diagram, and will necessarily vary somewhat in different circumstances. The valve preceding the filter should be of a type with an internal resistance of some 10,000 ohms, and in order to preserve correct loading of the filter the load on the output terminals should also be 10,000 ohms. In the case of a transformer coupling, this is easily arranged by shunting the primary with a 10,000 ohms resistance (R), and with a resistance coupling by using a 10,000 ohms coupling resistance.

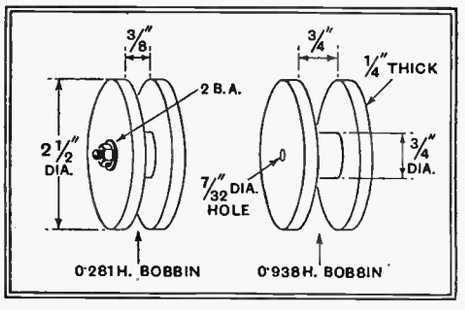


Fig. 2.—The dimensions of the coil bobbins and their construction will be readily apparent. The 0.281 H. coils each have 3,300 turns of 40 D.S.C. wire, while the 0.938 H. coil has 7,000 turns of the same wire.

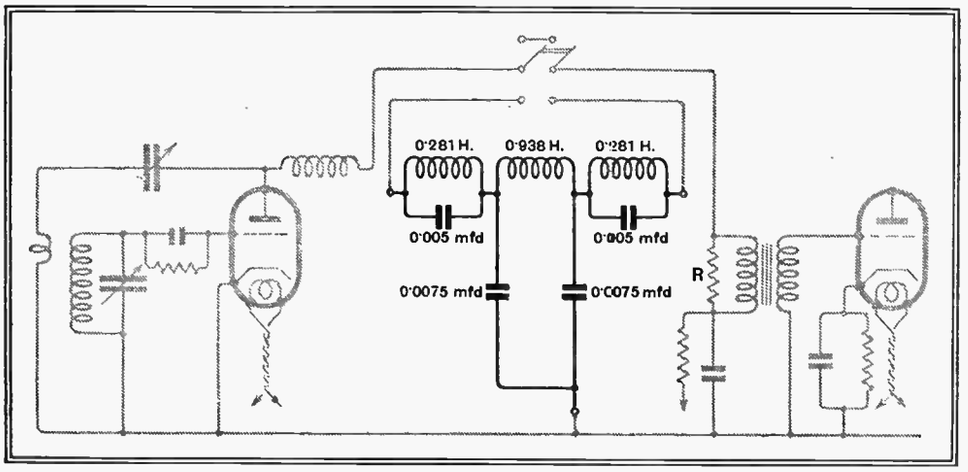


Fig. 1.—The complete circuit diagram of the filter is shown in heavy lines, and the shaded portion of the diagram indicates the connections to a typical receiver, including the use of a switch for cutting it out of circuit when it is not required.

Constructing the Coils

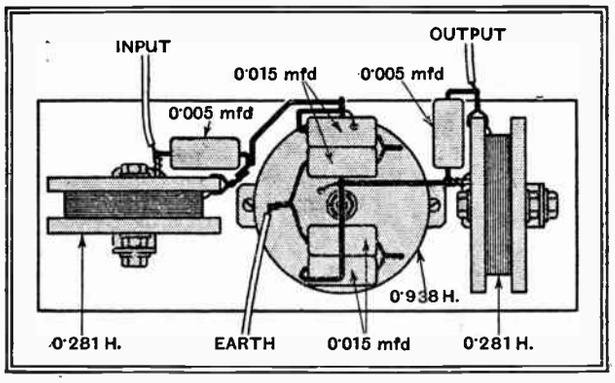
The filter has some deleterious effect upon the quality, although this is by no means as much as one would at first expect. It is obviously desirable to be able to cut it out of circuit, therefore, when the station is not suffering from whistle interference, so that the double-pole switch should be included, and connected as shown in Fig. 1. With the switch in the upper position the filter is thrown out of circuit.

The coils themselves can readily be wound by hand, but it is a great saving if a small winding machine can be arranged with a revolution counter. In each case, the core of the former consists of a

[1] *The Wireless World*, July 21st and 28th, 1933.

Building a Whistle Filter—

length of ¾ in. dowelling, a material which is readily obtainable. When assembling the formers, the dimensions of which are given in Fig. 2, care should be taken to see that the cheeks fit flush with the ends of the core so that the first turns of wire do not slip between the cheeks and core.



The wiring plan of the low-pass filter. It should be noted that pairs of 0.015 μF condensers are connected in series to produce capacities of 0.0075 μF.

The two smaller formers are used for the 0.281H. coils, and each must be wound with 3,300 turns of No. 40 D.S.C. wire; in order to avoid breaks where the wire is led out, it is a wise plan to solder a length of heavier wire, say, No. 32 gauge, to the No. 40 and wind the first few turns with this. The 0.938H. choke is wound on the larger former, and requires 7,000 turns of the same wire.

The Coil Mounting

The method of mounting the coils will be seen in the photograph of the complete filter. Small aluminium brackets serve to hold the coils in place, and care should be taken to mount them at right angles to one another with their centres in line, otherwise the coupling between them will modify the filter characteristics.

It will be noted from Fig. 1 that two condensers of 0.0075 mfd. capacity are needed. This is not a standard capacity, however, so that actually each of these condensers consists of two series connected 0.015 mfd. condensers.

Operating the Filter

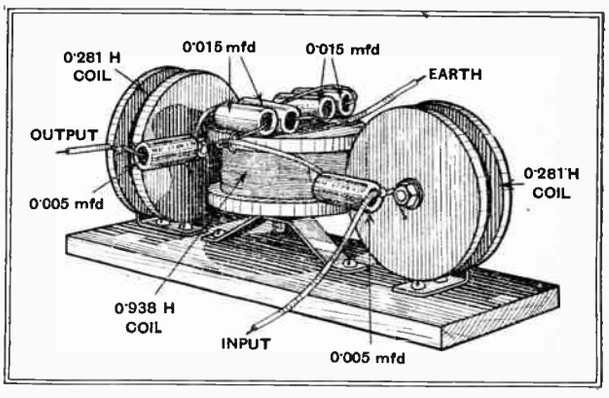
The diagram of Fig. 1 shows that the normal H.F. choke in the detector anode circuit can be left in place, and if the set be fitted with reaction this is necessary on account of the input capacity of the filter. If the receiver be one without reaction, however, it is better to omit the H.F. choke and to join the detector anode directly to the input terminal of the filter; the usual anode-cathode by-pass condenser should also be removed, for the input capacity of the filter at high frequencies is sufficient to take its place.

When testing, it may be found at first that little difference in the quality of reproduction is discernible, whether the filter be in circuit or not. This should not necessarily be taken as a sign that the filter is not functioning correctly, for the restriction of the high-frequency response is not so much noticeable as a loss of high notes as in a change in the tone of certain musical instruments.

The real test of the filter lies in its ability to remove high-pitched whistles.

It should be noted that if the receiver itself is incapable of reproducing much above 3,500 cycles, the addition of the filter will not appreciably affect the results, for the high frequency whistles will have been already removed. With selective sets, the presence of sideband splash is a good test of the high note response; if such interference be found, therefore, it may be taken that the use of the filter will permit the removal not only of the sideband splash itself but also of some of the steady heterodyne whistles.

A further use for the filter lies in reducing needle scratch in the electrical reproduction of gramophone records, for most of the scratch frequencies lie above 3,500 cycles. The connections for this, of course, are identical with those for a whistle filter, and if the receiver be arranged in the usual way for the addition of the pick-up to the detector valve the filter will automatically change its function from a whistle suppressor to a scratch filter when the gramophone pick-up is brought into action.



The general construction of the filter can be seen from this drawing, together with much of the wiring.

DISTANT RECEPTION NOTES

Those Finnish Stations : The Harmonics Problem

A CORRESPONDENT writing from Helsinki asks why I never refer in these notes to the Finnish transmitters. "We have," he says, "three high-powered transmitters, and I should think that Lahti, at any rate, ought to be heard in England." None of the Finnish transmitters is at all regularly heard in this country. I have occasionally received Lahti, but even on a big superheterodyne signal strength has never been better than moderate. Viipuri I logged once a year or two ago, but I have not heard the station since, and Helsinki has never made an appearance in my log.

The Kootwijk transmitter, which takes over the Huizen service from 3.40 p.m. onwards, is gaining notoriety as a prize generator of harmonics. The last published report of the Brussels Laboratory of the U.I.R. shows that no fewer than four occur regularly and are definitely identified. These are the fourth, which heterodynes Langenberg and Lyons Doua at times; the fifth, just below the Scottish Regional; the sixth, almost on top of Cracow and Genoa; and the eighth, close to Lodz. The seventh harmonic also probably occurs, but this falls on 267.8 metres, where there is already such a hopeless jam that identification is virtually impossible.

As I have hinted previously, the problem of harmonics, particularly from the long-wave stations, may assume considerable importance when the Lucerne Plan comes into operation. Matters may be brought to a head when Daventry, Zeesen, and other stations increase their power.

High Power from France

Radio-Paris is amongst the long-wave stations whose power will be increased to 150 kilowatts in the not-far-distant future. At a recent dinner of the French Association of Wireless Manufacturers M. Eynac, who was then Minister of Posts and Telegraphs, announced this fact. He stated, also, that the PTT stations built or building under the General Ferrié Plan at Toulouse, Lyons, Marseilles, Nice, Rennes, and Lille would all be completed and transmitting at high power before the end of next year.

Transatlantic reception continues to be wonderfully good in the early mornings, and now that sunrise is becoming so much later more and more reports of "before breakfast" reception will probably come in. Many of the bigger American stations do not close down until 2 a.m. Eastern Standard Time, which is 7.30 a.m. by ours, and not infrequently they are to be found at work an hour or more later than this.

A certain amount of improvement in the matter of heterodyne interference is noticeable at present. The whistle accompanying Luxembourg is often hardly noticeable, and Kalundborg is coming in quite free from interference as a rule.

Interference with Kootwijk's transmissions of the Huizen programmes has not been noticeable for some days prior to the time of writing and good reception has been the rule. Zeesen, Motala, and Oslo have all provided excellent reception on the long waves. Oslo, though good as a rule, is sometimes heterodyned.

Both Vienna and Budapest are well heard; in fact, transmissions coming in at full loud speaker strength are to be picked up now at almost every division of the tuning dial between 465 and 550 metres.

In the remainder of the medium waveband, Rome, Stockholm, Katowice, Toulouse, Leipzig, Strasbourg, Brussels No. 2, Poste Parisien, Hilversum, Turin, Nürnberg and Fécamp are outstanding. And there are at least a dozen other stations that are generally well received. D. EXER.

The Output Stage

Obtaining Maximum Volume Without Distortion

By S. O. PEARSON, B.Sc., A.M.I.E.E.

THE output stage, which comprises the last valve in a receiver, with its associated circuits, is essentially different from any other valve stage. This article explains, in the simplest possible terms, the necessity for reasonably accurate matching between valve and loud speaker.

THE output valve acts in a totally different capacity from any of the other valves in a wireless receiver, its function being to cause the greatest amount of power to be delivered to the loud speaker with a given signal voltage applied to the grid. Output valves are accordingly designed with this end in view, and take the form of either power valves (triodes) or pentodes, and special measures have to be taken to match the speaker impedance to the A.C. resistance of the valve. The necessary power-handling capacity of the valve depends on the maximum undistorted output required, this in turn being determined by the volume desired and the sensitivity of the loud speaker in use.

The loud speaker, of course, comprises the "load" or external impedance in the anode circuit of the power valve, whether the speaker be connected directly in the anode circuit or indirectly through the medium of usual output transformer or choke-filter circuit. Whichever system is employed, it can be resolved into the electrical equivalent of an impedance Z connected directly in the anode circuit of the valve as in Fig. 1. When a signal voltage is applied to the grid, current variations are set up in the speaker coil and operate the cone or diaphragm. It is only the alternating component of the anode current which is effective in operating the loud speaker, the steady anode current being only a necessary evil. It must be remembered that the power, or energy, does not come from the valve at all, but from the source of H.T. supply, and that the power valve acts merely as the means of controlling both total power consumed and the A.C. power delivered to the speaker.

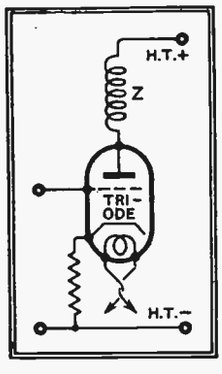
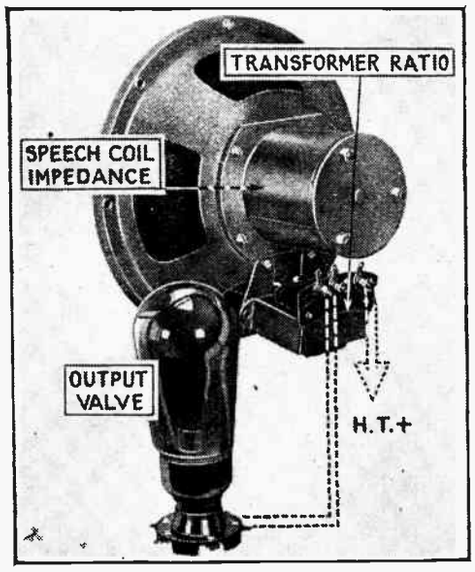


Fig. 1.—In an output stage, the loud speaker acts as an impedance in the anode circuit.

Matching the Speaker Impedance

To obtain maximum power input to the speaker with a given applied grid-voltage variation, the effective impedance of the speaker must bear a definite relationship to the A.C. resistance of the valve itself under operating conditions. Unfortunately, it is impossible to calculate the best value of impedance with mathematical accuracy, for two main reasons. In the first place the impedance is a function of the frequency, a rise in frequency usually being associated with a rise in impedance, and so, as the speaker has to operate over the whole range of musical frequencies, the matching must be effected at about the middle of the range, usually at or near the frequency corresponding to middle C of the musical scale. Secondly, at a given frequency, the power delivered to a given impedance in the anode circuit depends on the composition of this impedance, that is to say, on the relative values of resistance and reactance comprising the impedance. It is a well-known principle in A.C. circuits that the average power absorbed is less than the product of R.M.S. amps. and volt A power factor has to be employed, and in an inductive circuit this is always less than unity. In a circuit with all reactance and no resistance the power factor is zero and no power is absorbed.



Factors to be taken into account in matching a loud speaker to the output valve.

For Maximum Power

To simplify matters, let it be supposed in the first place that the speaker impedance in the anode circuit comprises a pure resistance R. Then it can be shown quite simply that the maximum A.C. power is developed in this resistance when it is made exactly equal to the A.C. resistance of the valve. For instance, suppose that the A.C. resistance of the valve is 1,000 ohms and that the alternating voltage at the grid causes, in effect, an E.M.F. of 20 volts to be set up in the anode circuit. If the load impedance is made equal to 1,000 ohms, the total resistance of the circuit is 2,000 ohms and the current, found by Ohm's Law, is 10 milliamps. The power in the external resistance is therefore $I^2R = 100$ milliwatts. Now, making the load resistance any other value, say, 500 ohms, the total resistance is 1,500 ohms and the current 13.3 milliamps. The power in R is then $I^2R = 88.8$ milliwatts, which is less than before. Similarly for any other value of external resistance the power would be found to be less than 100 milliwatts.

If, then, the loud speaker could be considered as a pure resistance, maximum output would be obtained by choosing a value equal to the valve resistance. But the presence of reactance upsets this condition, and since the reactance varies with frequency a compromise must be struck. In practice it has been found generally satisfactory to make the effective speaker impedance at the middle frequency about twice the A.C. resistance of the valve. The frequency characteristics of most loud speakers are such that a fairly good balance between upper and lower frequencies is attained with this ratio of effective speaker impedance to valve resistance.

Use of an Output Transformer

It often happens that a particular loud speaker is required to be operated by an output valve whose A.C. resistance is not suited to the impedance of the speaker. In fact, most speakers are wound with very low impedance coils and cannot be directly operated by any valve. In such cases an output transformer is used, being of the ordinary two-circuit type and connected as shown in Fig. 2 (a), or of the auto type, or tapped choke, being connected as in Fig. 2 (b).

By a suitable choice of the ratio of primary to secondary turns the widely differing impedances of the speaker and valve can be effectively matched. If N

The Output Stage.—

is the ratio of primary to secondary turns of the transformer, a load impedance of Z ohms across the secondary terminals is equivalent, in its effect, to an impedance

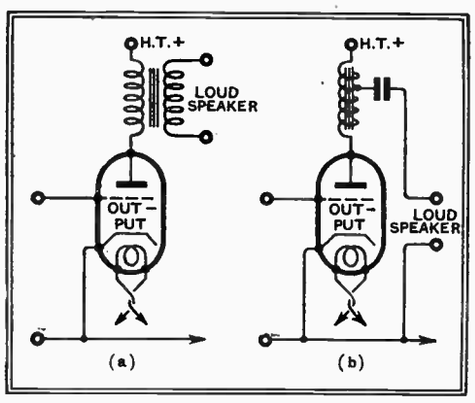


Fig. 2.—Either a double-wound transformer (a) or a tapped choke or auto-transformer (b) may be used for matching the loud speaker to the output valve.

of N^2Z ohms in the primary circuit. Now for the *effective* load impedance in the anode circuit of the valve to be twice the A.C. resistance Ra of the valve, N^2Z must be equal to 2Ra. So, in words, the turns ratio of the output transformer must be equal to the square root of the ratio of twice the valve resistance to the speaker impedance ($N = \sqrt{2Ra/Z}$).

In the case of an auto-transformer or tapped choke, N is the ratio of the total turns to those between the tapping and the upper or H.T. supply end.

When the speaker impedance and valve resistance have been suitably matched to give the best balance between the upper and lower frequencies in the response, the maximum possible power that can be delivered to the speaker without introducing noticeable valve distortion depends on the design of the valve itself and on the value of H.T. employed. The pentode output valve is in a class by itself and must be dealt with separately. In the case of an ordinary power valve or triode the A.C. resistance is made as low as possible compatible with a reasonably high mutual conductance. Of the total energy drawn from the H.T. supply by the power valve, only a fraction of about one-fifth can normally be delivered to the speaker, the remainder being dissipated at the anode. So, in general, an output valve requires a moderately high anode current. And, further, since the available power, with a given anode current, is proportional to the H.T. voltage, the valve should be operated at the maximum H.T. voltage specified by the makers.

In Next Week's Issue—

Special Articles for the

RADIO-GRAMOPHONE ENTHUSIAST.

Pick-up Circuits, Tone Control Units and Gramophone Accessories.

Television Explained

III.—The Problem of Synchronisation

THE problems of synchronising are briefly discussed in this article, and the high degree of accuracy required is emphasised. Normally the synchronising impulses in the transmission serve to provide isochronism only.

IT might be thought that satisfactory synchronisation of the Nipkow discs at the transmitter and receiver could be obtained by the simple process of using identical motors and adjusting them to run at the same speed, by controlling the receiver motor by means of a variable resistance or some similar device. It might be thought also that the mechanism of a clock could be pressed into service, for it is one of the most accurate pieces of mechanism in common use. One which gains or loses a minute a week is considered to be only a fair timekeeper, and yet this represents an accuracy of 0.0154 per cent. The degree of accuracy necessary in the synchronisation of the discs for television purposes may perhaps be realised when it is remembered that it corresponds to a clock which gains or loses no more than one second in several months.

Where 12½ pictures are transmitted a second, and there are 30 lines to a picture, the disc must rotate 750 times a minute. Many methods of synchronisation have been proposed, but that now used in the B.B.C. transmissions is quite simple. The transmitted picture is arranged to have a black strip along the top, with the result that at the beginning of each scanning line there is a sudden pulse of current in the photo-cell circuit, and this leads to a similar black strip along the top of the received picture. One pulse of current per line means 375 pulses a second, and by means of suitable filters they can be picked out of the picture currents proper and applied to a motor on the shaft of the receiving disc. The power available, of course, is quite insufficient to drive the disc, so that this is run by an electric motor, the speed of which is regulated by the synchronising impulses.

The Synchronising Impulses

This is carried out by an arrangement such as a phonic wheel, which is really a miniature electric motor mounted on the same shaft as the main driving motor. The phonic wheel, or similar device, is fed by the 375 cycles synchronising impulses, and receives one impulse at the start of every scanning line. If the driving motor is running too quickly the synchronising impulses are received by the controlling motor too late, and it exercises a breaking effect upon the disc and retards its speed. If the motor is running too slowly an accelerating effect is produced. The result is that within limits the 375 cycles pulses maintain the transmitter and receiver discs in isochronism, that is, they run at exactly the same speed.

Although they may run at the same speed, they are not necessary in synchronism, for this involves a question of phase. The discs are in isochronism if they are running at the same speed, but if one be displaced relatively to the other in an angular direction they are not in synchronism. Exact synchronism is only obtained when the discs are running at the same speed and their holes are in identical relative positions at all times. Thus, in Fig. 1 the two discs at (a) are in isochronism when they are running at the same speed, but, since the holes are not in the same relative positions, they are not in synchronism. True synchronism is shown at (b), where at every instant the holes in the receiving disc correspond exactly with those in the transmitting disc.

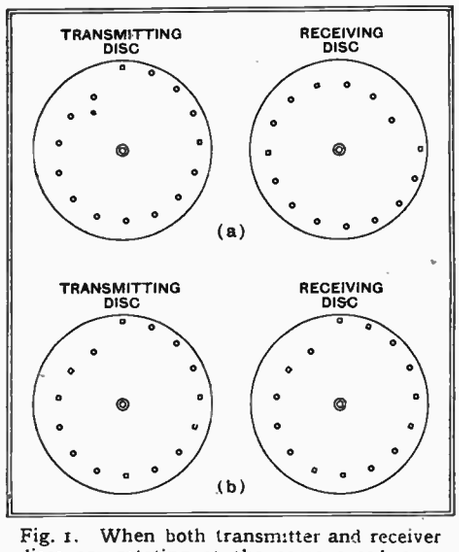


Fig. 1. When both transmitter and receiver discs are rotating at the same speed, synchronism is obtained although the holes may not be in the same relative positions. Isochronism requires that the hole positions be in the same positions as in the left hand drawing.

In practice, true synchronising is obtained by trial and error. The synchronising impulses enable isochronism to be readily established, and the picture can then be seen, even if the holes in the discs do not correspond. Unless perfect synchronisation is obtained, however, the picture will be divided with the left-hand half on the right-hand side of the screen, and vice versa. It is a simple matter, therefore, to retard the motor momentarily until it is in exact synchronisation.

NEWS of the WEEK

Current Events in Brief Review

Faux Pas

RESTORATIVES are being applied to a French author who absent-mindedly gave a tip of 75 centimes to the official who collected his radio licence fee.

"S.B." Expert Resigns

THE resignation of Mr. George F. McClelland from the Vice-Presidency of the American National Broadcasting Company deprives that company of its pioneer executive organiser, says our Washington correspondent. Mr. McClelland directed the first transcontinental "hook-ups" before the N.B.C. was founded in November, 1926.

More Power by Day ?

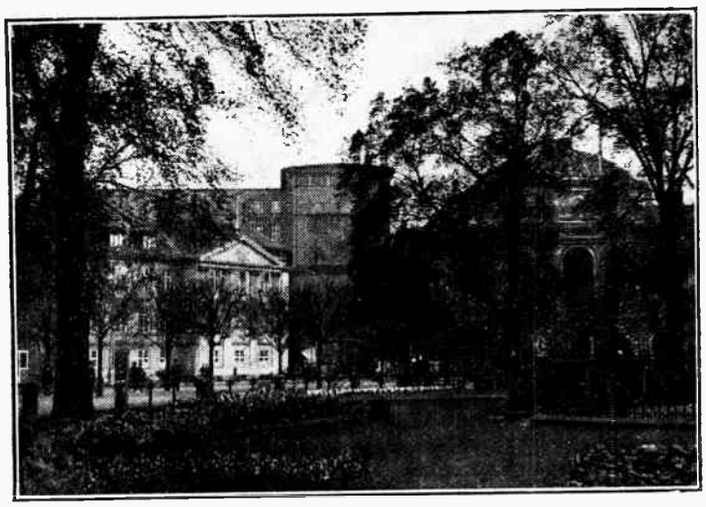
THE American Federal Radio Commission is considering the suggestion that all broadcasting stations should be allowed to increase their power during daylight hours when range is admittedly less than at night.

The outcome of the discussion will be awaited with interest by the European International Broadcasting Union.

The Old Topic

HAVING been accused of causing wet weather, wireless is now charged with producing droughts. Writing in the *Nottingham Evening News*, a correspondent says: "Through all the ages the clouds have been spread over the heavens and have given us rain arriving true to season; but since the advent of wireless, and the continuous flow of the high-tension vibrations through the ether, the clouds have become grouped, and instead of long periods of seasonal rain, we get 'out-of-season' deluges and long spells of dry weather."

However, he states that it will be the flat, tropical countries that will be the first to be uninhabitable from this cause. This is comforting to those of us in the temperate zone.



DENMARK'S BROADCASTING CENTRE.—A picturesque view in Copenhagen showing the Danish State "Broadcasting House" on the left. A concert of French opera and ballet music will be broadcast from here on Sunday afternoon. In the right background is the Royal Opera House, from which many performances are relayed.

Blind Justice

LOUD speakers and microphones assisted the judges to impartial decisions during the recent annual Eisteddfod at Sion Church, Caerau. Artistes rendered their items in the vestry which adjoins the main hall, in which the adjudicators appraised the value of each performance without knowing which artiste was performing.

Will Fécamp Shut Down ?

DESPITE rumours of the forthcoming closure of Radio Normandy, Fécamp, our Paris correspondent assures us that the station's "immediate suppression" is not yet on the cards. Fécamp has merely received formal notification that the power must not be increased above the authorised output of 700 watts. In other words, it appears that there will be no change for the time being.

If the future of Fécamp is precarious, so is that of all the other private stations in France with the exception of Radio Toulouse, which is believed to have a real chance of survival, and of Poste Parisien, which, although it may disappear as a private station, will probably be absorbed into the State transmission scheme.

Circuits in Morse

THE remarkable feat of transmitting four complicated circuit diagrams from New Zealand to England has just been accomplished. An amateur in Dunedin gave a point-to-point description of these diagrams to a colleague in South London, accompanying it with a technical article over 1,000 words in length. Short-wave morse transmission was used, diagrams and article being thus morsed 11,000 miles for ultimate reproduction in the "T. & R. Bulletin," the official organ of the Radio Society of Great Britain.

A Present from Poland

A LARGE number of listeners all over the country tuned in the English talk given by Mr. Thad Ordon from Warsaw on Saturday last, and, as notified in *The Wireless World*, were able to claim the gift of an attractively illustrated book dealing with Poland and its history. Mr. Ordon's talk came through at good strength, and we understand that it was the forerunner of a number on various topics of interest to British listeners.

R.A.F. Radio Dinner

A REUNION dinner of officers of the R.A.F. Electrical and Wireless School is to be held at the Royal Air Force Club, 128, Piccadilly, London, W.1, on Saturday, November 25th, 1933. Particulars are obtainable from the Hon. Secretary, Mr. J. F. Herd, Ditton Corner, Datchet, Slough.

Ferranti Wins Trophy

WE congratulate Messrs. Ferranti, Ltd., on being awarded first place as the result of the ballot organised by the Wireless Retailers' Association in conjunction with Allied Newspapers for the "best-value-for-money" set shown at the Manchester Radio Exhibition. The winning instrument was a Ferranti Lancastria Parva five-valve Superheterodyne. Ferranti, Ltd., have won the trophy for the second successive year.

Cinema Exhibition

ALL interested in cinema work, both amateur and professional, and in sound recording on film will be attracted by the Cinema Exhibition to be held in the Dorland Hall, 18-20, Regent Street, London, S.W.1, from November 27th to December 9th. All the latest standard and sub-standard home and industrial ciné equipment will be demonstrated, together with sound-recording and re-recording systems, film developing and printing plants. Educational, cultural and publicity films will be shown in a public studio, and a feature will be the filming of visitors, the results to be shown later in one of the many demonstration theatres.

The "behind-the-scenes" model film-recording studio, complete with camera and recording equipment, should merit special attention. The Exhibition will be open daily from 10 a.m. to 10 p.m.

Cross-Channel Micro Waves

IN about a week's time the new "micro-wave" wireless stations at Lympne and St. Inglevert aerodromes will be opened for regular communication between London and Paris on a wavelength between 17 and 19 centimetres. The stations are to be used for regular transmission by teleprinter and as an additional safety arrangement for cross-Channel flights. The transmitter power will be only 500 watts.

The highly concentrated beam will, of course, avoid any interference with other wireless services. Communication with the land lines of Lympne and St. Inglevert will be entirely automatic.

Medium Waves Across the Atlantic

THE extremely favourable conditions for transatlantic reception at the moment, to which reference has frequently been made by "D. Exer" in "Distant Reception Notes, is the subject of a letter we have received from Mr. W. J. Atterton, of Mottingham, London, S.E.9.

"During the last few days," he writes, "such stations as WNAC (Boston) and WCAU (Philadelphia) have been heard as early as 10 p.m.

"Paul Whiteman's orchestra was heard on October 27th on a wavelength of 266 metres at 3 a.m. It is not necessary to get up at this very early hour because an American station has been received very well up to 6.30 a.m. on 348 metres (approximately), the programme consisting of late dance music from the Hotel ——, Atlantic City, New York."

Our correspondent's set is a 1932 Pye superheterodyne receiver Type S1, not fitted with A.V.C.

A New Inspector

IT has been left to our French contemporary, *L'Antenne*, to discover an official "inspector of aerials" whose existence had hitherto been unsuspected. Our contemporary assures its readers that it has discovered this "Vérificateur des Antennes" in the Government pay rolls. The official journal, from which the news has been gleaned, does not specify the class of aerial inspected. "But the job exists," says our contemporary, "and *that* is the essential."

"THE WIRELESS ENGINEER"

Special Articles in the November issue.

A NEW HIGH EFFICIENCY CATHODE-RAY TUBE.
Applications as a Projecting Oscillograph,

CIVIL AVIATION SIGNAL SERVICES.
Considerations Affecting the Choice of Wavelengths.

A MULTI-RANGE DIRECT-READING OHMMETER.

MODIFICATIONS IN A NEW IMPEDANCE MEASURING SET.

THE TILT OF RADIO WAVES AND THEIR PENETRATION INTO THE EARTH.

Copies are now on sale, price 2/6, or post free from the Publisher, 2/8.

Page 377 follows Programme Supplement.

The Wireless World

FOREIGN PROGRAMME SUPPLEMENT

SUNDAY

NOVEMBER THE TWELFTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.0 p.m.,** Dance Music. **7.30,** Song Recital by Alice Raveau. **7.55,** News. **8.0,** Time. **8.2,** Concert by the Grand Station Orchestra, conducted by Henry Defosse. **8.30,** News. **8.35,** Four Fables (La Fontaine), on Gramophone Records. **8.45,** News. **8.50,** Concert (contd.). **9.30,** News. **9.35,** Variety Music. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.0 to 2.15 p.m.,** Programme by the I.B.C. (Ireland), Ltd. **1.0,** Variety Music: Dixie Doorway (Parish); Under a Blanket of Blue (Symes); Happy as the Day is long (Koehler); I guess I'll have to change my Plans (Schwartz); Waltzing in a Dream (Young); Don't be late in the Morning (Leckerq); Deep Water (Schwartz); Home on the Range (Billy Hill). **1.30,** Concert of Dance Music: Are you sure you love me?; Sarita Tango; Trouble in Paradise; I give my Heart. **1.45,** Dance Music: Jam-lam-a-do-do-do; Never too old; Waltzing alone with you; Shuffle off to Buffalo; You're getting to be a Habit with me; Lazybones. **2.0,** Variety Music: Selection from Wonder Bar (Katscher); Songs: (a) The Wayside Rose, from Frederica (Lehár), (b) Only a Rose, from The Vagabond King (Friml); Selection from Waltzes from Vienna (Joh. Strauss). **8.30,** Time Signal. **8.31,** Concert relayed from the Gaiety Theatre, **Dublin. 10.0,** The Station Orchestra. **10.15,** A Drama, by The Strollers. **10.45,** The Station Orchestra. **11.0,** Time, News, Weather Report and Close Down.

BARCELONA

EAJ1, 858 kc s, 349.6 metres; 8 kW.—**11.0 a.m.,** Chimes from the Cathedral and Weather. **12 Noon,** Gramophone Music. **1.0 p.m.,** Gramophone Music. In the interval at **1.30,** Theatre Notes. **2.0,** Sextet Concert. **3.0,** Programme for Hospitals and other Benevolent Institutions, with Gramophone Records. **4.0 to 5.30,** Interval. **5.30,** Agricultural Talk and Gramophone Music. **6.0,** Concert by the Radio Orchestra. **6.30,** Song Recital by Anita Reull. **7.0,** Concert by the Radio Orchestra, and Herta Harnion (Songs). **8.0,** Dance Music from Hollywood Bar. **9.0,** Gramophone Music. **10.45,** Chess Lesson. **11.0** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**9.0 a.m.,** Programme from **Rome. 9.30,** Agricultural Talk. **9.45,** Religious Address. **10.0 to 11.0,** See **Turin. 11.30,** See **Rome. 11.45 to 1.30 p.m.** (approx.), See **Turin. 3.45 till Close Down,** See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BERLIN

DEUTSCHLANDSENDER (REICHSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**5.15 a.m.,** Gymnastics. **5.30,** To-day's Motto. **5.35,** Harbour Concert from **Hamburg. 7.0,** Agricultural Talks. **7.50,** Radio Report from a Berlin Polling-Booth. **8.10,** Divine Service. **9.0,** Radio Report from a Berlin Polling-Booth. **9.5 to 9.10,** Weather Report. **10.0,** Report from a Hamburg Polling-Booth. **10.5,** Talk: The German Lord's Prayer. **10.15,** Weather. **10.30,** See **Leipzig. 11.0,** Report from a Station Polling-Booth at Leipzig. **11.5,** Concert conducted by Hermann Pape. **11.55,** Time Signal. **12 Noon,** Election Results. **12.5 p.m.,** Concert from **Breslau. 1.0,** Election Results. **1.5,** Programme of Children's Songs. **1.30,** Talk for Young People. **2.0,** Report from a Polling-Booth in Cologne. **2.5,** Variety Programme. **2.30,** Talk. **3.0,** Report from a Polling-Booth in Munich. **3.5,** Concert from **Heilsberg. 4.0,** Election Results. **4.5,** A Musical Play. **5.0,** Election Results. **5.5,** Country Programme. **5.30,** Will Vesper reads from his own Works. **6.0** till Close Down, **Berlin (Deutschlandsender)** and **Berlin (Funkstunde)** Exchange Programme. **6.0,** Concert by the Station Orchestra, conducted by Camillo Hildebrand and the Berlin Funkstunde Orchestra, conducted by Dr. (Helmuth) Thierfelder). In the intervals, Election Results. The Station Orchestra: (a) Overture., Der Freischütz (Weber), (b) Suite, Aus Thüringen (Joachim Raff). The Berlin (Funkstunde) Orchestra: (a) Overture, Der Bärenhäuter (Siegfried Wagner), (b) Three Swedish Dances, Op. 98 (Paul Graener). The Station Orchestra: (a) Prelude and Extract from Der Corregidor (Hugo Wolf), (b) Elfenreigen (Klose), (c) Tarantella from Venezia e Napoli (Liszt), (d) Two Movements from the Romantic Suite, Op. 37 (Koch). The Berlin (Funkstunde) Orchestra: (a) Prelude to Die Königskinder (Humperdinck), (b) Concert Waltz, Liebesgeständnis (Nicolé), (c) Suite in Dance Form, Op. 21 (Kienzl). The Station Orchestra: (a) Fröhliches Wandern, Op. 79 (Hugo Kaun), (b) Ballet Music from The Merry Wives of Windsor (Nicolai). (c) Waltz, Aquarellen (Jos. Strauss). The Berlin (Funkstunde) Orchestra: (a) Overture, Donna Diana (Reznicek), (b) Pizzicato-Polka (Joh. Strauss), (c) Kaiser-Walzer (Joh. Strauss). **9.0,** News. **9.45,** Weather. **10.0** (approx.), Concert of Light Music, with Election Results in the intervals. **2.0 a.m. (Monday)** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419.5 meres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB** and **DJE.**—Election Day Programme.—**10.30 a.m.,** See **Leipzig. 11.0,** See **Munich. 12 Noon,** Concert from **Heilsberg. 1.0 p.m.,** Interval. **1.30,** A Play for Young People. **2.1.** Berlin Curiosities **2.30,** Gymnasties to Music—A Radio Report from a Gymnastic Display. **3.0.** See **Breslau. 4.15,** Gramophone Concert of German Opera Music. **5.0,** The Evening of Life—Programme of Music and Readings. **5.55,** Lottery Announcements. **6.0** till Close Down, **Berlin (Deutschlandsender)-Berlin (Funkstunde)** Exchange Programme (for details see **Berlin (Deutschlandsender).** In the interval at **9.0,** News.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.3 metres; 14 kW.—**6.5 p.m.,** Pianoforte Recital by Miklas Strauss. Pianoforte Concerto in C Minor. Op. 37 (Beethoven); Polka in F (Smetana). **6.45,** See **Prague. 8.0,** Comedy in One Act (Turgenev), translated by Ruppeldt. **9.0,** See **Prague. 10.0** (approx). Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.** Election Day Programme.—**11.0 a.m.,** Concert by the Silesian Philharmonic Orchestra, conducted by Rischka. **1.0 p.m.,** News. **1.10,** Talk on Wireless Reception. **1.25,** Concert of Light Music by the Radio Quartet. **2.35,** Programme for Children. **3.0,** Concert by the Station Orchestra, conducted by Töpitz; Soloist, Hellmut Hallendorf (Tenor). **4.15,** A Silesian Fun Fair—Radio Scenes with Music. **5.0,** Two Tales (Walter Badenhoop). **5.20,** Dialogue: The First Film of Gliding. **5.40,** Reading. **6.0** till Close Down, **Berlin (Deutschlandsender)** and **Berlin (Funkstunde)** Exchange Programme (See **Berlin (Deutschlandsender)** for details). In the interval at **9.0,** Time and News.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.0 p.m.,** German Transmission: The Barber of Bagdad—Comic Opera in Two Acts (Peter Cornelius). **6.0,** See **Prague. 10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc s, 509.2 metres; 15 kW.—**10.0 a.m.,** Concert by the Small Station Orchestra. **11.0,** Gramophone Records. **12 Noon,** Concert of Light Music by the Radio Orchestra, conducted by Franz André. **1.0 p.m.,** Le Journal Parlé. **1.10,** Light Music, relayed from the Grand Hotel, Antwerp. In the interval at **1.30,** Sketches (Bach and Laverne), on Gramophone Records. **5.0,** Concert by the Radio Orchestra. **5.30,** Football Results. **6.0,** Pianoforte Recital by Simone Haye **6.30,** Gramophone Music. **6.45,** Les Clochards—Sketch (Blandin). **7.0,** Gramophone Records. **7.15,** Religious Address. **7.30,** Wireless Notes and Review of Music. **8.0,** Paganini—Operetta (Lehár), relayed from the Théâtre Royal Français, Ghent. In the first interval, Dans l'ascenceur-Sketch (Duvernois), followed by Gramophone Records. In the second interval, Le Journal Parlé, followed by Gramophone Records.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW.—**10.0 a.m.,** Gramophone Records. **11.0,** Concert by the Small Station Orchestra, conducted by Leemans. **12 Noon,** Concert conducted by Felleman, relayed from the Grand Hotel, Antwerp. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert of Light Music by the Station Orchestra conducted by Franz André. **5.0,** Dance Music by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp. **5.30,** Football Results. **6.0,** Quartet in A Flat (Golestan), on Gramophone Records. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans. **7.15,** Religious Address. **7.30,** Le Journal Parlé. **7.55,** Review of Music. **8.0,** Concert by the Station Symphony Orchestra, conducted by Kumps. Soloist: Heirstraete (Bass). **8.45,** Reading from Saul and David (Querido). **9.0,** Concert (contd.) **10.0,** Press Review.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert of Light Music by the Marco Orchestra. In an interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Review of the Week. **7.0,** Song Recital. **7.20,** Concert by the Station Orchestra. In an interval at **8.0,** Talk. **8.45,** Radio Journal. **9.0,** Dance Music, relayed from a Restaurant.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **7.20 p.m.** till Close Down.—**12 Noon,** Concert by the Opera House Orchestra and Soloists. Conductor: Otto Berg. **1.0 p.m.,** Gramophone Music. **2.0,** Agricultural Talk. **2.45,** Harp Recital by Klara Szarvas. **3.30,** Medical Talk. **4.0,** Concert by the Karl Bura Cigány Band. **5.0,** Talk. **5.30,** Jubilee Concert of the Budapest Citizens' Choir, relayed from the Academy of Music. **6.30,** Review of the Week. **7.0.** Sports Notes and Racing Results. **7.20.** Lili—Operetta in Three Acts (Hervé). **9.30.** Jazz Music by the Len Baker Band, relayed from the Hotel Ritz.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres,** and **Skamlebaek, OXY.—9.0 a.m.,** Divine Service from the Garrison Church. **10.30,** Weather and News. **11.0,** Town Hall Chimes. **11.2,** Dance Music for Accordion. **12 Noon,** Talk in English: Fleet Street. **12.20 p.m.,** Talk in German: The German Language. **12.40,** Reading in French: Le serpent d'étoiles (Jean Giono). **1.0,** Programme for Children—Heinrich og Pernille—Comedy in Three Acts (Ludwig Holberg). **2.25,** Concert of French Opéra-Comique and Ballet Music. **4.0,** Divine Service Relay. **5.20,** Talk. **5.50,** Weather and News. **6.15,** Time Signal. **6.30,** Talk: American Negro Literature. **7.0,** Town Hall Chimes. **7.2,** The Hansen Family Humorous Episode (Jens Locher). **7.15,** Concert of Classical Music for Strings, by the Radio Orchestra, conducted by Lanny Gröndahl. **7.50,** Recital of Student Songs, with Introductory Talk. **8.40,** Gramophone Records of Japanese and Chinese Music. **8.50,** News. **9.0,** Concert of Russian Music by the Radio Orchestra, conducted by Lanny Gröndahl. **9.50,** Dance Music from the Wivex Restaurant. In the interval at **11.0,** Town Hall Chimes. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**6.0 p.m.,** News. **6.5,** Miscellaneous Items and News. **6.15,** Talk on Child Welfare. **6.30,** See **Warsaw.** In the interval at **6.45,** Programme Announcements. **8.30,** Programme relayed from **Lwów, 788 kc/s, 381 metres. 9.30,** Sports Notes. **9.40,** See **Warsaw. 10.30** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I—Orchestral Concert. Signature Tune; Modern Conception of Russian Melodies (de Phillippi); By the Sleepy Lagoon (Coates); Wiener Blut (Strauss); Piccolo Solo: Scherzo, Sylvia (arr. La Thière); Selection from Wild Violets (Stolz); When you're getting along with your Gal; My Woman; I know you're lying. Part II—Organ Recital. By the Fireside; Nobody's Sweetheart; Sweet and Low (Brana-by); Caprice viennois (Kreisler); Tired Hands (Sanderson); Unequited Love (Lincke); Träumerei (Schumann); Il Bacio (Arditi); Signature Tune. **12 Noon,** Programme in French. **2.0 to 7.30 p.m.,** Programme in English by the I.B.C. **2.0,** Broadcast of Dance Music: Melody; Singin' through Georgia; Music Box Revue; Romance; I'll never have to dream again; Then I'll be happy; Moanin' low; Lover come back to me; Twelfth Street Rag; Red Red Robin; Bugle Call Rag; Just a little Street; Down in the Valley; How deep is the Ocean. **2.30,** Orchestral Concert: Selection from Waltzes from Vienna (Strauss); Love everlasting (Friml); Xylophone Solo: First Waltz (Durand); The Musical Box of Madame Pompadour (Noack); Waltz from Bitter Sweet (Coward); Xylophonia (Green); Stephen Foster Melodies; The Dwarf's Patrol (Rathke). **3.0,** Gramophone Concert: Moment musical (Schubert); One little hair on his head (Castling); It's Sunday down in Caroline (Symes); I'm the Landlord of the Inn in Aberfoyle (Fyffe); Selection from The

Merry Widow (Lehár); In the Valley of the Moon (Tobias); Fiddlin' Joe (Cavanaugh); Romance (Rubinstein). **3.30,** Special Birthday Request Programme: At the Convent Gate (Sherwood); Woodland Peace (Favilla); Serenade (Heykens); The Old Rustic Bridge by the Mill (arr. Wood); Bells across the Meadow (Ketelbey); In a Monastery Garden (Ketelbey); Come where my love lies dreaming (Foster); The Cockshafers' Tea Party (Noack). **4.0,** Quartet Selections: Gavotte from Mignon (Thomas); Violin Solo: Hymn to the Sun (Rimsky-Korsakov); Orientale (Glazunov); Andante cantabile (Tchaikovsky). **4.15,** The I.B.C. Nursery Corner with Columbus and Belinda: Birthday Greetings. **5.0,** Light Music: Selection from Give me a Ring (Broones); Veleta Medley (Varney); Black Moonlight (Coslow); Pianoforte Solo: Tony's Wife (Adamson); Song: Lay your head on my Shoulder (Conrad); Her first dance (Heykens); Vocal Quartet: Little Tommy (Macy); A Catastrophe (Sprague); Gridiron Club March (Sousa). **5.30,** Hawaiian Band: My South Sea Home (Camillio); What Aloha means (Alphin); Somewhere in Hawaii (Nelson); Maui Girl (Libornio). **5.45,** Concert of Dance Music: Tick, Tock; My Mother's Garden; Hold your Man; 'Twixt the Devil and the Deep Blue Sea. **6.0,** Concert: Scottish Patrol (Williams); Sam's Medal (O'Hagan); Throw open wide your window (Calson); Shadows on the Swanee (Young); The Wedding of the Rose (Jessel); I had to go and find another job (Scott); There's a Cabin in the Pines (Hill); Valse des Alouettes (Drigo). **6.30,** Request Concert: The Song of Songs (Moya); Brother, can you spare a dime? (Harburg); Dinner at Eight (Fields); The Londonderry Air (arr. Grainger); River stay 'way from my door; He's dead but he won't lie down; Butterflies in the Rain (Reeves); Land of my Fathers. **7.0,** Orchestral Concert: Blossoms from Mozart's Garden; Song without Words (Tchaikovsky); Flower Song from Carmen (Bizet); Morning (Grieg); Liebestraum (Liszt); Songs my Mother taught me (Dvorák); Old Spanish Song (Aubert); Music of the Spheres (Strauss). **7.30,** French Programme. **9.0** till Close Down, Programme in English by the I.B.C. **9.0,** Concert of Dance Music; Signature Tune, Happy Feet; Experiment (Porter); The Wedding of Mr. Mickey Mouse (Pola); Moths around the Candle Flame (Randal); Dawn in Montmartre (Demare); Goofus (King); Dancing Butterfly (Petkere); If you'll say Yes, Cherie (Noble); Oh, Jonanna (Lawrence); Signature Tune, Happy Feet. **9.30,** Talkie Time; Signature Tune, Sittin' in the Dark; In a Year, In a Day (Heymann); Song, Come out Vienna (Strauss); Selection from He wanted Adventure (Walter); Thanks (Coslow); She's everybody's Sweetheart now (Hargreaves); Mrs. Bartholomew (Ellis); There'll still be love (Marvel); Selection from College Humour (Coslow); Signature Tune, Sittin' in the Dark. **10.0,** Military Music: March, Hands across the Sea; In a Clock Store (Orth); Selection from Maritana (Wallace); The Teddy Bears' Picnic (Bratton); Riders of the Flag (Sousa); Down South (Myddleton); Hobomoko (Reeves); Selection from Iolanthe (Sullivan). **10.30,** Concert of Dance Music: The Last round up; Dinner at Eight; Mary Rose; Morning, Noon and Night; Sentimental Gentleman from Georgia; Don't blame me; My Moonlight Madonna; Lazybones; Everyone loves my Marguerite. **11.0,** Broadcast of Dance Music: Signature Tune, Happy Days are here again; My Own (Little); It's the Talk of the Town (Symes); Reflections in the Water (Loeb); Happy as the day is long (Koehler); How could we be wrong? (Porter); Mi Amor Esta en El Valle (Barreto); Vilia (Lehár); Shadows on the Swanee (Young); Signature Tune, Happy days are here again. **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Hindu Song (Rimsky-Korsakov); Dance of the Clowns (Smetana); Goodbye (Tosti); Mignonette (Friml); Minuet No. 1 (Paderevsky); Ocarina Solo: Under the Double Eagle (Tapiero); Song: The Mountains of Mourne (French); The Grasshopper's Dance (Bucalossi); Artist's Life (Strauss); Signature Tune, Come back to Erin. **12.5 a.m. (Monday),** Late News Bulletin in English. **12.10** (approx.), Club Concert for Wisheeh Listeners; Part 1: Mandoline Band; Trumpets; Signature Tune, The Chum Song; Loin du bal (Gillet); In Old Seville (Ege); La Czarine (Ganne); Napolitana (Meisel); Capriccio—Mazurka (Arienzo); Part II, Dance Music: Tiger Rag; The Song is you; Chansonnette; Sweetness; London Bridge is falling down; I wake up smiling; Moon Song; Rock-a-bye; Signature Tune. **1.0,** Dance Music; Signature Tune, Bells of Normandy; I sigh for you, Rio Rita; In Santa Lucia; Waltzing in a Dream; Castles in the Sand; In the Park in Paree; My Love Song; Out in the Open; Stay out of my Dreams; Dancing Butterfly; In the Valley of the Moon; Hold me; Sweep; Little Miss Muffet; I can't remember; Peter, Peter: There's a light in your Window; Meet me in the Gloaming; Signature Tune. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**

NOV. 12th SUNDAY *continued*

Election Day Programme.—**10.30 a.m.,** See **Leipzig. 11.0,** See **Langenberg. 12 Noon,** See **Stuttgart. 12.15 p.m.,** Gramophone Concert. **12.50,** Talks arranged by the Board of Agriculture. **1.0,** Rural Programme—Talk. **1.30,** Programme for Children. **2.30,** Programme to be announced. **3.0,** See **Langenberg. 4.0,** See **Berlin (Deutschlandsender). 5.0,** Programme to be announced. **5.45,** Sports Notes. **6.0** till Close Down. **Berlin (Deutschlandsender)** and **Berlin (Funkstunde)** Exchange Programme. (See **Berlin (Deutschlandsender)** for details.) In the intervals at **9.0,** Time and News, and at **9.20,** Local News and Weather. **2.0 a.m., (Monday),** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—**11.15 a.m.,** Concert by the Small Station Orchestra, conducted by Gerhard Maass. In the interval at **11.55,** Time and Weather. **1.0 p.m.,** Programme for Children, with Music by the Small Station Orchestra. **1.30,** Choral Concert, with Soprano and Organ Solos. **2.10,** Reading (Kurt Siemers). **2.45** (from **Kiel**), Wind Instrument Concert conducted by Ludwig Hacker. **4.15,** Variety Concert relayed from the Radio Exhibition in the Ernst-Merck-Halle. **4.45,** Anecdotes about Famous Men. **5.0** (from **Bremen**). A Visit to the Municipal Theatre. **5.50,** Weather. **6.0 till Close Down, Berlin (Deutschlandsender)** and **Berlin (Funkstunde),** Exchange Programme (for details see **Berlin (Deutschlandsender)**). In the interval at **9.0,** News. **2.0 a.m. (Monday),** Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**10.30 a.m.,** See **Leipzig. 11.0,** Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner. **1.0 p.m.,** Talk on Chess. **1.30,** Talk for Young People. **2.0,** Sonata in D Minor No. 3 for Violin and Pianoforte, Op. 108 (Brahms). **2.35,** Talk in Dialect. **3.0** (from **Danzig**). Concert conducted by Ernst Stieberitz. Sports Notes in the interval. **4.40,** Talk: Scharnhorst, the Prussian General. **5.0,** Song Recital by Erik von Nordenskjöld (Tenor). **5.30,** A Visit to Prof. Thienemann in his Home, on his Seventieth Birthday. **6.0** till Close Down, **Berlin (Deutschlandsender)** and **Berlin (Funkstunde),** Exchange Programmes (for details, see **Berlin (Deutschlandsender)**). In the interval at **9.0,** News.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.—11.40 a.m. to 1.40 p.m.,** Programme of the General Broadcasting Society (A.V.R.O.). **11.40,** Time Signal. **11.41,** Talk: The Films. **12.10 p.m.,** Concert of Light Music by Kovacs Lajos and his Orchestra. Gramophone Music in the intervals. **1.40 to 7.40,** Programme of the Workers' Radio Society (V.A.R.A.). **1.40,** Concert conducted by Hugo de Groot. **2.10,** Report of the International Swimming Championship in the Heiligeweg Baths at Amsterdam. **2.40,** Concert (contd.). **3.5,** Talk: Women Revolutionaries. **3.25,** Gramophone Music. **3.45,** Report on the International Swimming Championship (contd.). **4.0** (approx.), Concert (contd.). **4.20,** Recitations and Gramophone Music. **4.55,** Programme for Children. **5.40,** Concert by the Utrecht Municipal Orchestra. **6.10,** Report on the International Swimming Championship (contd.). **6.20,** Concert (contd.). **6.40,** The Adventures of Wakker and Tropendnit. **7.0,** Concert (contd.). **7.40** till Close Down. Programme of the A.V.R.O. **7.40,** Time Signal and News. **7.55,** Concert of Light Music by Kovacs Lajos and his Orchestra. **8.25,** Gramophone Music. **8.40,** Concert by the Wireless Orchestra, conducted by Albert van Raalte. **9.25,** Gramophone Music. **9.40,** Concerto for Violin and Orchestra (Bruch) by Herman v.d. Vegte (Violin) and the Wireless Orchestra, conducted by Albert van Raalte. **10.5,** Gramophone Music. **10.10,** Concert of Light Music by Louis Armstrong and his Band. **10.55,** Gramophone Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.,** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.—9.10 a.m. to 4.40 p.m.,** Programme of the Catholic Radio Society (K.R.O.). **9.10,** High Mass relayed from the Church of St. Anthony of Padua. **11.40,** Talk. **11.55,** Concert by the K.R.O. Orchestra, conducted by van 't Wond. In an interval at **12.40 p.m.,** Literary Talk. **1.40,** Religious Address. **2.10,** Gramophone Music. **2.20,** Concert by the Con Amore Quartet. In an interval at **2.40,** Gramophone Music. **3.55,** Programme for Invalids. **4.40 to 7.25,** N.C.R.V. Programme. **4.40,** Sacred Music. **4.55,** Organ Recital by Dijs. **5.10,** Divine Service, relayed from the Reformed Church, **Amsterdam. 7.25** till Close Down, K.R.O. Programme. **7.25,** Football Results. **7.30,** Geography Talk. **7.55,** Concert by the K.R.O. Orchestra, conducted by van 't Wond. **8.15,** Gramophone Music. **8.25,** Concert by the Catholic Children's Choir, Amsterdam; Conductor: Louis Schwirts; Soloist: Schnurman (Pianoforte). In the intervals at **8.40,** News, and **8.45,** Recitations by Käthe Kruse. **9.30,** Gramophone Music. **9.40,** Concert by the K.R.O. Orchestra. **10.20,** Epilogue by the Small Station Choir, conducted by Pickkers. **10.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc s, 249 metres; 0.8 kW.—**8.0 p.m.,** Sports Notes and Amusement Guide. **8.15,** Radio Concert. In the interval at **9.0,** News. **10.0,** Request Half-Hour. **10.30** till Close Down, Programme in English by the I.B.C. **10.30,** Selection of Popular Waltzes: The Blue Danube (Joh. Strauss); Live, Laugh and Love, from Congress Dances (Heymann); Waltz Song from Romeo and Juliet (Bizet); The Skaters' Waltz (Waldteufel); Wine, Women and Song (Joh. Strauss); Song: I give my Heart, from The Dubarry (Millöcker-Mackleben); Wedding Dance Waltz (Lincke); The Druid's Prayer (Dawson). **11.0,** Instrumental Concert. Organ Solo: La Paloma (Yradier); Pianoforte Duet: Selection from The Cat and the Fiddle (Kern); Xylophone Solo: Overture, Raymond (Thomas); Hawaiian Guitars: Dream Girl of Yesterday; Accordion Band: Coal Black Mammy (Cliff); Pianoforte Solo with Celesta Accompaniment: The Fairies' Gavotte (Kohn); Organ Solo: My Wishing Song (Burke); Bandonion Solo: Blaze Away (Holzmann). **11.30,** Concert of Light Music: The Wedding of the Rose (Jessel); Serenade (Heykens); Song: Roses at Dawning (Kahn); Lazy Pete (Kernstein); Jollity on the Mountains (Fetras); Song: Landlord fill the Flowing Bowl; Musical Comedy Switch (arr. Hall). **12 Midnight,** Dance Music: What a Perfect Combination; Standing on the Corner; Harlem Fuss; In the Valley of the Moon; Moon Song; Waltzing in a Dream; The Lady I Love; Hold me; Don't be late in the Morning; I can't remember; The Old Spinning Wheel; Maybe I love you too much; The Lady I Love; When my little Pomeranian; It's within your Power; Butterflies in the Rain. **1.0 a.m. (Monday),** I.B.C. Good-night Melody and Close Down.

KALUNGBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**10.30 a.m.,** See **Leipzig. 11.0,** Concert. **12 Noon,** See **Stuttgart. 12.15 p.m.,** Humorous Programme. **1.30,** See **Frankfurt. 2.30,** Choral Concert of German Folk Music. **3.0,** Dance Music. **4.0,** See **Berlin (Deutschlandsender). 5.0,** Variety Programme. **6.0** till Close Down. **Berlin (Deutschlandsender)** and **Berlin (Funkstunde),** Exchange Programme (for details see **Berlin (Deutschlandsender).** In the interval at **9.0,** Time and News from **Frankfurt. 2.0 a.m. (Monday),** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**10.15 a.m.,** Talk on the following Transmission. **10.30,** Mache Dich, mein Geist bereit—Cantata (Bach), by the Municipal and Gewandhaus Orchestra, the Choir of St. Thomas' and Soloists. **11.0,** Concert by the Station Orchestra, conducted by Hilman Weber; Soloists, Erich List (Flute) and Friedbert Sammler (Harpsichord). **1.0 p.m.,** Weather and Time. **1.5,** The Programme of the Week. **1.25,** Agricultural Talk. **1.35,** Lieder on Gramophone Records. **2.40,** The Healing Powers of Nature—a Dialogue on the Occasion of the Leipzig Exhibition for Health. **3.0 to 4.0,** See **Munich. 4.30,** Talk: The Baltic Countries. **5.0** (from **Dresden**). Pianoforte Recital by Karl Heinrich Diener von Schönberg. **5.40,** Reading (Heinrich von Kleist). **6.0** till Close Down. **Berlin (Deutschlandsender)** and **Berlin (Funkstunde),** Exchange Programme (see **Berlin (Deutschlandsender)** for details). In the interval at **9.0,** News. **2.0 a.m. (Monday),** Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—**12 Noon,** Concert by the Station Orchestra, conducted by Henri Pensis. **1.0 p.m.,** Gramophone Concert. **7.0** till Close Down. English Evening. **7.0,** Beatrice Harrison and the New Symphony Orchestra: Violin Concerto (Elgar), conducted by the Composer (on Gramophone Records). **7.30,** Recital of English Songs by Alice Schaus-Arend. **8.0,** Violin Concerto in D (Beethoven), by Hector Clockers and the Radio Orchestra, conducted by Henri Pensis. **8.50,** News in French. **9.0,** Gramophone Records. **9.15,** Concert of English Music by the Radio Orchestra, conducted by Henri Pensis: Overture, Maritana (Wallace); Bird of Love Divine (Haydn-Wood); I hear you calling me (Marshall); Suite, Nell Gwynn (Gorman). **9.45,** News in German. **9.55,** Concert by the Radio Orchestra, conducted by Henri Pensis: Waltz, Künstlerleben (Joh. Strauss); Frühlingsmärchennacht (Krome); Nic et Nac (Demaret); Selection from Paganini (Lehár-Salabert). **10.25,** Dance Music on Gramophone Records.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Programme relayed from **Madrid (EAJ7). 12 Midnight** till Close Down. Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Signature Tune: Come back to Erin; Volga (Dostal); Hawaiian Sweetheart of Mine (Heagney); Butterflies in the Rain (Myers); Aloha Oe! (Lilioakalani); Yes, Mr. Brown (Abraham); The Old Blind Man (Castillo); Kilima Waltz (Traditional): The Regiment of Peace (Reisfeld); Signature Tune: Come back to Erin. **12.30 a.m. (Monday),** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**11.30 a.m.,** Municipal Band Concert, relayed from the Retiro. **2.0,** Chimes, Time, Theatre Notes and Popular Concert. **4.0 to 7.0,** Interval. **7.0,** Chimes, Announcements and Dance Music. **8.30 to 9.30,** Interval. **9.30,** Chimes and Time. **9.35,** Music Competition—Pianoforte Recital by Rafael Arroyo and Song Recital by Esteban Garcia Luz (Tenor). In the interval, Talk. **12 Midnight,** Chimes. **1.0 to 2.0 a.m. (Monday),** I.B.C. Programme of Dance Music. Happy as the Day is Long; Let's all be happy Together; Spanish Sweetheart; I lay me down to Sleep; Two of Irish; Cornflowers and Poppies; Selection from Forty Second Street; My Wishing Song; When my little Pomeranian; Flor de Cuba; A Perfect Day; Parade of the Minutes; Nobody's Sweetheart; Living in a Dream; Somebody stole my Gal; Isn't is Heavenly; Two Buck Tim. **2.0,** I.B.C. Good-night Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**6.20 p.m.,** Pianoforte Recital by Alfred Rotter. **6.45,** See **Prague. 7.0,** Concert of Light Music by the Station Orchestra, conducted by Musil. **8.0** till close down, See **Prague. 10.0** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.**—**9.45 a.m.,** Radio Film in Swedish. **10.45,** Weather. **1.45 p.m.,** Weather. **2.0,** Extracts from La Mascotte—Operetta (Audran). **4.0,** English Lesson. **4.30,** Lecture Recital. **5.30,** Borodin Concert relayed from the Radio Theatre: Symphony No. 1; Songs; Trio from Prince Igor; Symphony No. 3; Finale from Mlada. **8.0,** News. **8.30,** Programme Announcements. **8.55,** Chimes from the Red Square. **9.5,** Press Review. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.** Election Day Programme.—**10.30 a.m.,** See **Leipzig. 11.0,** Concert from the Feldherrnhalle. **12 Noon,** Time, Weather and Programme Announcements. **12.10 p.m.,** Agricultural Talk. **12.30,** Two Strausses—Talk, with Gramophone Records. **1.30** (from **Nürnberg**), Chess Lesson. **2.0,** Pianoforte Recital. **2.25,** Programme for Children. **3.0,** Concert by the Station Orchestra, conducted by Hans Winter; Soloists, Dina Grohmann (Soprano) and Lina Daimer (Violin). **4.0,** See **Berlin (Deutschlandsender). 5.5,** Reading: Sven Hedin's March through the Gobi Desert (Friedrichs). **5.25,** Soprano, Violin and Pianoforte Recital. **5.45,** Weather and Sports Notes. **6.0** till Close Down. **Berlin (Funkstunde)** and **Berlin (Deutschlandsender),** Exchange Programme, for details, See **Berlin (Deutschlandsender).** In the interval at **9.0,** Time, Weather and News.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW.—Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Nottodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1**

NOV. 12th SUNDAY *continued*

metres; Rjukan, 671 kc/s, 447.1 metres; and **Jelöy LGL, 6,990 kc s, 42.92 metres.**—**9.20,** Sacred Music on Gramophone Records. **9.50,** Chimes. **10.0,** Divine Service, relayed from the Castle Chapel. **12 Noon,** Symphony Concert by the Philharmonic Orchestra. **4.15 p.m.,** Choral Concert, relayed from the Glemmen Church, Fredriksstad. **5.0,** Recital by Pastor Zwilmeyer of his own Settings of the Psalms. **5.15,** Pianoforte Recital of Bach, Chopin and Liszt Music, by Alexander Borovsky. **5.55,** Talk with Illustrations: Italian Opera in Berlin. **6.15,** Weather and News. **6.30,** Recital of Swedish Songs by Nils Svanfeldt. **7.0,** Time Signal. **7.1,** Talk: The Representations of Christ in Art. **7.30,** Concert of Popular Music by the Station Orchestra. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** M. M. B. Lanstad reads from his own Works. **9.45,** Dance Music on Gramophone Records. **11.0** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**9.40,** Sacred Music. **10.5,** Agricultural Talk. **11.45,** Giornale Radio. **12 Noon to 1.0 p.m.,** Dance Music. In the interval at **12.30,** Time, Announcements and Weather. **4.30 to 5.30,** Gramophone Music. **7.0,** Dopolavoro Announcements and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.25,** Sports Notes, Time and Announcements. **7.45,** Symphony Concert. In the interval, Talk on Garibaldi. After the Concert, Gramophone Music. **10.0,** Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**10.0 a.m.,** Gramophone Music. **10.10,** Press Review. **10.30,** Gramophone Music. **11.0,** Symphonic Jazz, directed by Lucien Moraweck. **12.15 p.m.,** Popular Sound Film Music. **12.45,** Variety Item. **12.50,** Programme by Paul Weile. **1.20,** Interval. **1.30,** Variety Music. **2.0 to 7.0,** Interval. **7.0,** Le Journal Parlé. **7.5,** Gramophone Records of Armand Crabbé. **7.20,** Sports Review. **7.30,** Catholic Review. **8.0,** Lucienne Boyer on Gramophone Music. **8.15 to 8.35,** Interval. **8.35** Literary Programme: Poems inspired by the War. **9.10 to 9.30,** Interval. **9.30,** Concert. **10.30,** News.

PARIS

RADIO-PARIS (CFR), 174 kc/s, 1,725 metres; 75 kW.—**7.45 a.m.,** Gramophone Music. **8.0,** News. **9.20,** Advanced English Lesson. **9.40,** Elementary English Lesson. **10.0,** Elementary Book-keeping Lesson. **10.20,** Advanced Book-keeping Lesson. **10.40,** Spanish Lesson. **12.0 Noon,** Religious Address by the Reverend Father Dieux. **12.20 p.m.,** Sacred Music: Prelude in E Flat (Saint-Saëns); Grand Toccata in D Minor (Bach). **12.30,** Gramophone Records. In the interval at **12.45,** News. **1.30 to 2.30,** Programme in English by the I.B.C.; Gramophone Concert: Parlez-moi d'amour (Lenoir); La Vague (Metra); Fontane (Padilla); La Cinquantaine (Gabriel Marie); Passionate Idyll (Razigade); Glow Worm Gavotte (Lincke); Pastel (Paradis); Santander (van Hoorebecke). **2.0,** Concert of Dance Music: Signature Tune, Happy Feet; Headin' for a Weddin'; Tony's Wife; Pettin' in the Park; Come out Vienna; There's no Harm in Hoping; If you don't want to be Sweethearts; The Shadow Waltz; It's a nice Day to-day; Signature Tune, Happy Feet. **3.0 to 3.30,** Programme in English by the I.B.C.; Orchestral Concert: Scottish Patrol (Williams); Strauss Potpourri (arr. Winter); Selection from The Passing Show of 1915 (Finck); In a Persian Market (Ketelbey); Selection from The Desert Song (Romberg). **4.0 to 4.15,** Programme in English by the I.B.C.; Gramophone Music: Apollo (Yatove); J'ai deux amours (Scotto); El Carrerito (Los Hoyos); March of the Pierrots (Bosc). **5.0,** Variety Concert. **7.0,** Popular Concert. **8.0,** Music Hall Programme; The Orchestra, conducted by Maurice André. In the interval at **8.30** and **9.15,** News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**5.30 to 6.30 p.m.,** Radio City Concert, from **New York. 7.0 to 9.30, New York** Relay. **7.0,** Grenadier Guards' Band. **7.30,** Variety Programme. **8.0,** Melody on Parade. **9.0,** True Railroad Stories. **9.15,** Morin Sisters. **9.30,** Vesper Services. **10.30,** Grand Hotel, from **New York. 11.0,** Pathé News. **11.15,** Weather and Sports. **11.30,** Happy Felton's Orchestra. **11.45 to 2.45 a.m. (Monday), New York** Relay. **11.45,** True Engineering Stories. **12 Midnight,** Vincent Lopez Orchestra. **12.30,** Joe Penner. **1.0,** Egon Petri and Orchestra. **2.0,** Gulf Headliners. **2.30,** Walter Winchell. **2.45,** Marvellous Melodies. **3.0,** Orchestral Concert. from **New York.**

PORSGRUND.—See **Oslo.**

PRAGUE

613 kc/s, 488.6 metres; 120 kW.—**11.15 a.m.,** Concert by the Station Orchestra, conducted by Otakar Parik; Soloist, Josef Schwarz (French Horn). **12.30 p.m.,** Agricultural Talk. **12.45 to 12.55,** Talk for Women. **1.50,** Introductory Talk to the Following Transmission. **2.0,** Hansel and Gretel—Opera in Three Acts (Humperdinck), relayed from the National Theatre. **4.20,** Gramophone Music. **4.30,** Reading. **4.45,** Gramophone Music. **5.0,** German Transmission: Music Review, and Vocal and Orchestral Concert of Music by Biber, Demantius and Hamnerschmidt. After the Programme, News. **6.0,** News. **6.5,** Talk: In a Turkish Village. **6.20,** At School and at Home. Op. 33 (Kricka), by a Girls' Choir and the Station Orchestra, conducted by the Composer. **6.45,** Reading. **7.0,** Brass Band Concert; Soloists: Tino Muff and Anna Gronwellova (Songs). **8.0,** Time Signal. **8.2,** A Comedy in Three Acts (Maril, Czech Translation by Rasek). **9.0,** Time and News. **9.20,** Concert of Schrammel Music. **10.0** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**8.55 a.m.** (from **Geneva**), Chimes. **9.0** (from **Geneva**), Protestant Service, relayed from the Victoria Hall. **10.0** (from **Geneva**), Gramophone Concert. **11.30,** News and Weather. **11.40** (from **Geneva**), Gramophone Concert. **1.0 p.m.,** Interval. **2.0** (from **Geneva**), Concert of Light Music on Gramophone Records. **4.0,** Interval. **5.0** (from **Geneva**), Variety Items. **5.20** (from **Geneva**), Gramophone Music. **5.35** (from **Geneva**), Talk: The Reformation in Geneva. **6.5** (from **Geneva**), Organ Recital by William Montillet, relayed from St. Joseph's Church. **6.30** (from **Geneva**), Radio Chronicle and Sports Notes. **7.0** (from **Geneva**), Dramatic Programme. **7.30** (from **Geneva**), Talk on the Harpsichord. **7.50** (from **Geneva**), Couperin Bicentenary Concert by the Radio-Suisse Orchestra, conducted by Cortot; Soloists, Isabelle Nael-Lander (Harpsichord) and Hélène Wuilleumier (Violin); Introductory Talk; Harpsichord Solos: Les folies françaises ou les dominos; Concerto No. 5 in F for Violin and Harpsichord, from Les Goûts réunis; Harpsichord Solos, Pièces de Clavecin; Concert dans le goût théâtral (arr. Cortot). **9.0,** News and Weather. **9.10** (approx.), Close Down.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**4.0 p.m.,** Concert of Kálmán Operetta Music, conducted by Parups. Selection from Countess Maritza; Waltz from The Bayadere; Selection from The Little Dutch Girl; Selection from The Circus Princess. **5.0,** Agricultural Talk. **5.30,** Talk: The Côte d'Azur. **6.0,** Weather Report. **6.5,** Concert of French Music, conducted by Medins. **7.0,** News. **7.20,** Recital of French Bergerettes of the Eighteenth Century. **7.40,** Orchestral Concert. **8.0,** Weather and News. **8.35,** Dance Music on Gramophone Records. **9.0,** Dance Music by the Vlaseks Orchestra. **10.0** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres,** from **7.45 p.m.;** and **2RO.**—**9.45 a.m.,** Bible Reading. **10.0 to 11.0,** See **Turin. 11.30,** Gramophone Music. **11.45 to 1.30 p.m.** (approx.), See **Turin.** In the interval at **1.0,** Time and Announcements. **3.45 (Naples),** Programme for Children, Weather and Sports Notes. **4.0,** Sports Report. **4.15,** Vocal and Instrumental Concert. In the interval at **5.0,** Sports Report. **5.30 to 5.40** (approx.). Weather. **6.30,** Sports Notes and News. **7.0,** Time and Announcements. **7.15,** Soprano Solos. **7.30,** Sports Review. **7.45,** Variety Concert. **8.30** (approx.), Il sole di Austerlitz—Play in One Act (Carlo Salsa). **9.0** (approx.), Variety Programme, directed by Bonavolontà. **10.0,** Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.**—**7.0 to 9.0 p.m.** (approx.). **New York** Relay. **7.0,** Gene Arnold and the Commodores. **7.30,** Looking over the Week. John B. Kennedy. **7.45,** Gems of Melody. **8.0,** Wayne King's Orchestra. **8.30,** Radio Pulpit. **12.45 to 3.45 a.m. (Monday), New York** Relay. **12.45,** Wendell Hall, Songs. **1.0,** Variety Programme. **2.0,** Manhattan Merry-Go Round. **2.30,** American Album of Familiar Music. **3.0,** Jack Benny; Frank Black's Orchestra. **3.30,** RCA Programme. **3.45,** Mobilisation for Human Needs ,from **New York,** followed by Programme Resumé

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**9.0 a.m.** (from **Zürich**), Catholic Service. **10.30** (from **Zürich**), Gertrude von Le Fort reads from her own Works. **11.0** (from **Zürich**), Richard

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Strauss Music on Gramophone Records. **11.30**, Time, Weather and News. **11.40 (from Zürich)**, Concert by the Radio Orchestra. **12.30 p.m. (from Zürich)**, Agricultural Programme. **1.30 to 3.0**, Interval. **3.0 (from Zürich)**, Light Music on Gramophone Records. **4.0 (from Basle)**, Military Music, relayed from St. Martin's Church. **5.30 (from Zürich)**, Reading in Dialect. **6.0 (from Zürich)**, Time and Sports Notes. **6.5 (from Zürich)**, Ballet Music from The Damnation of Faust (Berlioz) on Gramophone Records. **6.20 (from Zürich)**, Talk: Present Generation and the Church. **6.50 (from Zürich)**, Mass, Op. 86 (Beethoven); relayed from the Tonhalle. **8.0** (approx.), News. **8.10** (approx.), Programme of Dance Music by the Radio Orchestra, with Gramophone Records. **9.15 (from Zürich)**, Sports Notes and Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 134.8 metres; Ostersund, 409 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**8.0 a.m.**, Rural Programme. **8.30**, Gramophone Music. **9.10** (from **Göteborg**), Programme for Workers. **9.20**, Talk on Gymnastics. **10.0**, Divine Service. **11.45**, Weather. **12 Noon**, Concert by a Male Voice Choir, relayed from **Boden, 242 kc/s (1,239.5 metres). 12.30 p.m.**, Gramophone Music. **1.30**, Armistice Day Programme, relayed from the Concert Hall. Addresses and Music. **3.0**, Elementary English Lesson. **3.30** (from **Sundsvall**), Programme for Children. **4.5** (from **Ostersund**), Song and Guitar Recital. **4.30**, Reading. **5.0**, Evensong. **6.15**, Weather and News. **6.35**, Radio Legend (Karl Ragnar Gierow). **7.50**, Recital by Romana Hambrigk (Songs) and Bronislaw Gimpel (Violin). **8.45**, Weather and News. **9.0**, Light Music by Herman Martensson's Ensemble. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**9.30 a.m.**, Orchestral Concert, conducted by Maurice de Villars. **10.40**, Protestant Service. **11.30**, Catholic Service in German. **12 Noon**, Gramophone Music. **12.45 p.m.**, News. **1.0**, Time Signal. **1.1**, Addresses at the Congress of Chiefs of the French Boy Scouts' Association under the Presidency of Marshal Lyautey, relayed from the Baeckehiesel Restaurant. **2.0**, Talk: Arboriculture. **2.15**, Gramophone Music. **2.30**, Interval. **3.0**, Mass in B minor (Bach), by the Choir and Orchestra of the Concert Society, relayed from the Conservatoire. **5.0**, Concert of Chamber Music. **6.0**, Medical Talk. **6.15**, Sports Talk. **6.30**, Concert of Light Music conducted by Roskam. **7.30**, Time Signal and News. **7.45**, Talk, relayed from the Final Session of the Scout Congress: An Appeal to Boy Scouts. **8.0**, Press Review in German and Lottery Results. **8.30**, Alsatian Programme. **10.30**, Press Review followed by Dance Music from the Savoy. **12 Midnight**, Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.** Election Day Programme.—**10.30 a.m.**, See **Leipzig. 11.0**, See **Langenberg. 12 Noon**, Topical Talk. **12.15 p.m.**, Popular Music on Gramophone Records. **1.15**, Talk: The Sculptor's Art throughout the Ages. **1.30**, See **Frankfurt. 2.30**, See **Berlin (Funkstunde). 3.0**, See **Langenberg. 4.0**, See **Berlin (Deutschlandsender). 5.0**, Wind Instrument Concert. **5.40**, Sports Notes. **6.0** till Close Down. **Berlin (Deutschlandsender)** and **Berlin (Funkstunde)**, Exchange Programme (for details, see **Berlin (Deutschlandsender)**). In the interval at **9.0**, see **Frankfurt**, and at **9.20**, Local News. **2.0 a.m. (Monday)**, Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**11.0 a.m.**, Dance Music. **11.30**, Orchestral Concert. **11.45**, Selections from Opera. **12 Noon**, Music by a Viennese Orchestra. **12.30 p.m.**, Catholic Service. **12.45**, Light Music. **1.0**, Amusement Guide, Exchange and Time. **1.5**, Light Music. **1.15**, Operetta Music. **1.45**, Protestant Service. **2.0**, Opera Music: Selection from William Tell (Rossini), and The Huguenots (Meyerbeer); Overture, Don Giovanni (Mozart). **2.15**, Agricultural Report. **2.30**, Chansonettes. **2.45**, Light Music. **3.0**, Music from Sound Films. **3.30**, Operetta Music. **4.0**, Light Music. **4.15**, Opera Music. **4.30**, Music on a Cinema Organ. **4.45**, Choral Music. **5.0**, The dansant. **5.45**, Music by an Argentine Orchestra. **6.0**, News. **6.15**, Accordion Music. **6.30**, Light Music. **6.45**, Orchestral Music. **7.0**, Spanish Songs. **7.15**, News and Horse Racing Results. **7.30**, Extracts from A Night on the Bare Mountain (Mussorgsky). **7.45**, Opera Music. **8.0**, Military Music. **8.15**, Music from Sound Films. **8.30**, Orchestral Music. **9.0**, Concert Version of La Bohème (Puccini), followed by Music by a Viennese Orchestra. **10.0**, Chansonettes. **10.15**, News. **10.30**, Programme for Listeners in Morocco. **11.0**, Light Music. **11.15**, Tango Songs. **11.30**, Orchestral Music. **11.45**, Operetta Music. **12 Midnight**, News. **12.5 a.m. (Monday)**, Opera Music. **12.15**, Orchestral Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**8.40 a.m.**, Programme from **Turin. 8.55**, Mass from the Cathedral of San Giusto. **9.35**, Agricultural Report. **10.0**, Religious Address. **10.20**, Agricultural Report. **11.0** till Close Down. See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**10.0 a.m.**, Mass from the Church of the Annunciation, **Florence. 11.0**, Bible Reading. **11.30**, Gramophone Music. **11.45**, Sponsored Music. **12 Noon**, Time and Announcements. **12.5 to 1.15 p.m.**, Variety Concert. **2.0**, Transmission of an Opera. In the interval, Sports Notes. **5.15**, Weather. **6.0**, Time. Football Results, Donolavoro Notes and Gramophone Music. **6.15**, Gramophone Concert. **7.0**, News and Gramophone Music. **7.30**, Dollari e gondole—Operetta in Three Acts (De Nigris). In the intervals, Talk and Theatre Notes. After the Operetta, Giornale Radio.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**10.20 a.m.**, The Austrian Homeland—A Fantasia for Augmented Orchestra on Austrian Folk Melodies (Dr. Lothar Riedinger). The Wiener Symphoniker, conducted by Oswald Kabasta. **11.20**, Recital of Modern Austrian Songs by Anton Tauscher (Baritone). **11.50 to 1.0 p.m.**, Concert of Light Music by the Wiener Symphoniker, conducted by Josef Holzer. **1.50**, Time, Programme Announcements and Weekly News Review. **2.5**, Review of Books. **2.30**, Chamber Music by the Mairecker Quartet. **3.45**, Talk. **4.15**, Concert by the Wiener Symphoniker, conducted by Josef Holzer. **5.30**, Talk: Great Austrians. **6.0**, Songs and Arias by Franz Völker. **6.50**, Time, Sports Notes and Programme Announcements. **7.0**, Austria—A Radio Sequence (Dr. Hans Nüchtern). **8.15**, News. **8.30**, Third Act of Siegfried—Opera (Wagner), relayed from the State Opera House. News after the Programme.

NOV. 12th SUNDAY *continued*

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**8.0 a.m.**, Time Signal and Hymn. **8.5**, Gymnastics. **8.20**, Gramophone Music. In the interval at **8.35**, Radio Journal. **8.50**, Hints for the Housewife. **8.53**, Programme Announcements. **9.0**, Divine Service, relayed from **Wilno, 530 kc/s, 566 metres,** followed by Sacred Music on Gramophone Records. **10.57**, Time Signal, and Fanfare from St. Mary's Church, Cracow. **11.5**, Programme Announcements. **11.10**, Weather Report. **11.15**, Concert of Polish Music by the Philharmonic Orchestra, conducted by Wolfstal. Soloist: Nawrocki (Pianoforte). Introductory Talk. In the interval at **12.0 Noon**, Political Talk. **1.0 p.m.**, Talk by Captain Studzinski: Reminiscences of the Polish Wars. **1.15**, Agricultural Market Report. **1.25**, Gramophone Music. **2.0**, Talk: The Polish Campaign of 1918. **2.20**, Hungarian Music by the Maison Fukier Orchestra. **3.0**, Programme for Children. **3.30**, Gramophone Music. **3.45**, Recitations. **4.0**, Talk. **4.15**, Pianoforte and Song Recital of Popular Polish Music. In the interval, News. **5.0**, Dramatic Programme relayed from **Lwów, 788 kc/s, 381 metres. 5.40**, Popular Songs. **6.0**, Talk on Art. **6.5**, Miscellaneous Items. **6.30**, Review of the Week for Young People. **6.45**, Programme Announcements. **6.50**, Talk for the Fifteenth Anniversary of Polish Independence Day. **7.5**, Concert by the Station Orchestra, conducted by Nawrot. Soloist: Orzechowski (Vibraphone). **8.5**, Radio Journal. **8.15**, Topical Talk. **8.30**, Programme relayed from **Lwów. 9.30**, Sports Notes. **9.40**, Concert of Viennese Music by the Station Orchestra, conducted by Nawrot. Soloist: Greta Turney (Songs). In an interval at **10.0**, Aviation Weather Report and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

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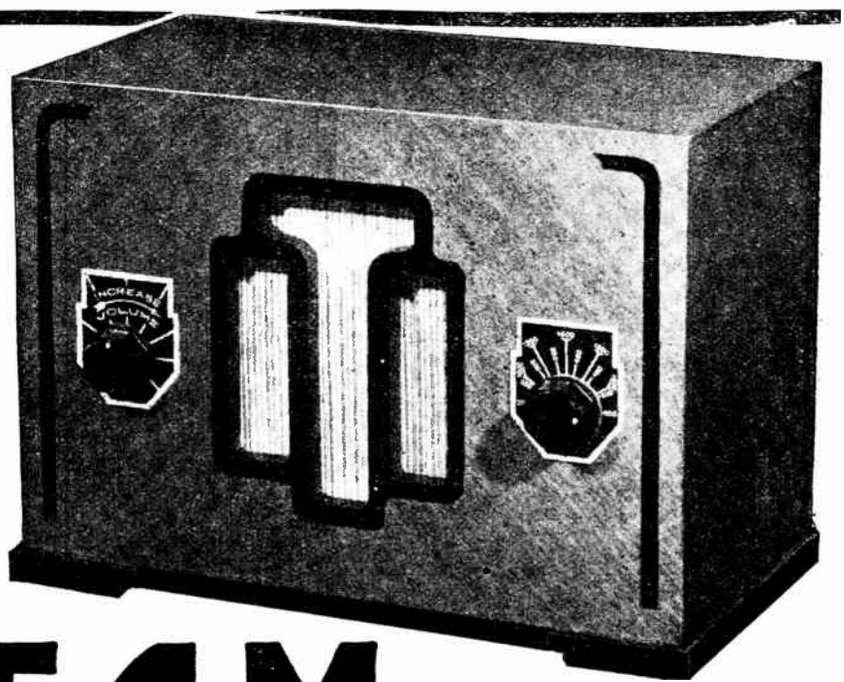

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7 GNS

COMPLETE NO EXTRAS

In the Drawing Room

MONDAY
NOVEMBER THE THIRTEENTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes. **7.15,** Agricultural Report and Weather Forecast. **7.20,** Agricultural Talk. **7.35,** Operetta Music. **7.55,** News. **8.0,** Time. **8.2,** Lottery Results. **8.10,** Concert by the Zimmer Quartet: Quartet in A (Boccherini); Quartet in F (Dvorák). In the interval at **8.30,** News. **9.0,** Readings from Plays (Victor Hugo). **9.20,** Song Recital. **9.30,** News. **9.35,** Military Music. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gaelic Talk. **7.15,** Miracles of Science, by a Doctor. **7.30,** Time Signal. **7.31,** The Station Orchestra. **8.0,** Song and Pianoforte Recital, by Mr. and Mrs. Neeson. **8.30,** Violin Solos by Richard Kiernan. **8.45,** The Station Orchestra. **9.0,** Contralto Solos by Sydney Jameson. **9.15,** Gaelic Song Recital by Denis Cox. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Military Band Music: Hungarian Rhapsody (Liszt); Glow-Worm Idyll (Lincke); Waldmere March (Losey). **9.45,** Orchestral Concert: Shepherd's Hey (Grainger); Waltz, Liebesleid (Kreisler); Violin Solo: Au mois d'avril (Adlington); Autumn (Chaminade). **10.0,** Concert of Light Music: I've got to sing a Torch Song (Dubin); Are you sure you love me; Under a Blanket of Blue (Symes); I couldn't tell them what to do; Lying in the Hay; Argentina Moon (Elkins); Lullaby of the Leaves (Petkere). **10.30,** I.B.C. Good-night Melody, followed by News and Weather. **10.40,** Traditional Fiddle Solos by C. MacFhionnlaoich. **10.50,** Uilleann Pipe Solos by Sean Dempsey. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Trio No. 3 (Rameau); Melody (Rubinstein); Prelude in B flat, No. 21 (Chopin); Ariosa (Delibes); Scherzo Waltz (O. Straus); Czardas (Colin). **7.0,** Request Gramophone Records. **7.20,** Sports Notes. **7.30,** Exchange and Talk in Catalan. **8.0,** Gramophone Music and News. **8.30,** Educational Programme: Geography and History Lesson. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5,** Humorous Review of the Week in Verse. **9.15,** Concert of Sardanas. **10.0,** Concert by the Station Orchestra. Soloist: Carmen Blanquer (Soprano): Berceuse de Jocelyn (Godard); Aria from La Sonnambula (Bellini); Andante from the Symphony in G (Mozart); Melody (Massenet); Soprano Arias from Don Giovanni (Mozart), and Rigoletto (Verdi); Overture, Le roi d'Ys (Lalo). **11.0,** News, followed by Dance Music from the Case Llibre. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Gramophone Music. **3.55** (approx.) to **7.0,** See **Rome. 7.0 to 7.15,** News in Albanian. **7.30** (approx.) till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**5.55 p.m.,** Time, Announcements and Talk. **6.30,** Song Recital. **7.0,** Trio for Clarinet, Violin and Pianoforte (Mozart). **7.30,** The Barber of Seville—Opera (Rossini) on Gramophone Records. In the interval at **9.0,** Time and News. After the Opera, Cigány Music relayed from the Knez Mihajlo Restaurant.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**11.5 a.m.** (approx.), Gramophone Concert: Grün ist die Heide (Blume); Tesoro mio (Becucci); Waltz, Monte Christo (Kotlar); Intermezzo, Aisha (Lindsay); Aubade printanière (Lacombe); Buddhas Liebesfeier (Kronberger); The Cherry Blossom Festival (Dicker); In the Tea House of a Hundred Steps (Yoshitomo); Dance of the Dervishes (Bendix); Love Serenade (Löhr); Ständchen (Heykens); Polka, Goldhähnchen (Sommerfeld); Dorfschwalben aus Oesterreich (Jos. Strauss); Polka, Bitte schön (Joh. Strauss); Rheinländer, Wiener Puppen (Mühlenau); Waltz, Münchner Kindl (Komzak); O sole mio (di Capua). After the programme, Weather. **11.55,** Time Signal. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Gramophone Concert: Overture, The Magic Flute (Mozart); Air (Bach); Irish Rhapsody (Herbert); Ingrid's Lament (Grieg); Der Feuerreiter (Wolf); Gesang Weylas (Wolf); Overture, Oberon (Weber); Selection from Coppélia (Delibes); Der Entfernten (Schubert); Liebe rauscht der Silberbach (Schubert); Ein Blümlein auserlesen (Schumann). **2.0,** Talk for Women. **2.30,** Weather and Exchange. **2.45,** Review of New Novels. **3.0,** Concert from **Breslau. 4.0,** Talk: Industry and the School. **4.25,** Recital of Modern Music: Four Songs Op. 36 (Trunk); Trio for Flute, Violin and Harpsichord (Kurt Fiebig), with the Composer at the Harpsichord. **5.0,** Poems. **5.5,** Radio Report of the Sail Planing in Gatow. **5.20,** Topical Talk. **5.30,** Wireless Technical Talk. **5.50,** Weather and Agricultural Notes. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** To-day's Motto. **7.5,** Topical Talk. **7.30,** Weber and Wagner Concert by the Augmented Station Orchestra, conducted by Edwin Lindner. Soloist: Rosalind von Schirach (Songs). Overture and Aria from Der Freischütz (Weber); Prelude and Elsa's Aria from Lohengrin (Wagner); Overture, The Flying Dutchman (Wagner); Prelude and Death of Isolda from Tristan and Isolda (Wagner); Overture, Tannhäuser (Wagner). **9.0,** News. **9.45,** Weather. **10.0,** See **Langenberg.**

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB** and **DJE.—3.0 p.m.,** Recital of Songs of the Eighteenth Century, by Werner Gisevius (Baritone); Antwort auf die Frage eines Mädchenes (Haydn); Die frühen Gräber (Neefe); Rhapsodie (Reichardt); Ein Seufzer (Klein); Rastlose Liebe (Selter). **3.15,** Reading. **3.30,** Concert from **Breslau. 4.30,** Talk: Have our Dreams any significance?—a Discussion between a Doctor, a Psychologist and a Woman. **4.50,** Reading of a Legend. **5.10,** Brahms Pianoforte Recital by Mitza Nikisch. **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** Lottery Announcements. **7.5,** Stirring Events in Berlin in the course of Six Centuries—a Programme of Extracts from Documents, Scenes and Songs. **8.0,** Nineteenth Century Chamber Music: Sonata in E Flat for Pianoforte and Horn, Op. 28 (Franz Danzi); Trio in E Flat for Pianoforte, Clarinet and Bassoon, Op. 43 (Kreutzer); Quintet in C Minor for Pianoforte, Flute, Clarinet, Horn and Bassoon, Op. 52 (Spohr). **9.0,** News. **9.30** (approx.). Concert from **Hamburg. 11.0** (approx.), Close down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.3 metres; 14 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Alexandre Moyzes: Overture, Fingal's Cave (Mendelssohn); Suite for Small Orchestra (Moyzes); Ballet Music from La Source (Delibes). **3.50,** See **Prague. 4.16,** Talk: Galileo. **4.25,** Pianoforte Recital by Macudzinski: Two Ballads, Op. 10 (Brahms); Ballad on Bylon's Manfred, Op. 2 (Novak); Ballad (Marx). **4.50,** Medical Talk. **5.5,** Concert by the Station Wind Instrument Quintet. **5.55,** Talk for Housewives. **6.0,** See **Prague. 6.10,** Talk. **6.25,** Concert by the Station Orchestra, conducted by Dyk. **7.10,** See **Moravska-Ostrava. 7.40,** See **Prague. 9.15** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—12 Noon,** Weather. **12.5 p.m.,** Popular Melodies on Gramophone Records: Hab Sonne im Herzen (Krome); Heute ist heut (Obermeyer); Dort unterm Baum (Kunkel); Der Wagen rollt (Fürst); Potpourri, Schön ist die Jugend (Rhode); Grossmütterchen (Langer); Aus Winkeln und Gassen (Hannemann); Winterlied (Koss); Potpourri, Aus deutschen Gauen (Christern). **12.45,** Time, Weather, News, Exchange and Shipping. **1.10,** Pictures from an Exhibition (Mussorgsky-Ravel), on Gramophone Records. **1.40,** Programme arranged by the Post Office, with Gramophone Music. **2.0,** Market Prices. **2.20** (from **Gleiwitz**), Talk: Religion in Upper Silesia. **2.40,** Book Review. **3.0,** Concert by the Station Orchestra, conducted by Topitz: Wedding Music (Jensen); Selection from Der Waffenschmied (Lortzing); Andante misterioso (Brusselmans); Scandinavian Suite (Torjussen); Vision (Gounod); Zigeunerlieder (Brahms); Overture, Fra Diavolo (Auber); Ein Schubert Stunde in Alt-Wien (Ralf); Romance (Tchaikovsky); Melody (Staub); Polka, Zig-Zag (Waldteufel); March, Immer höher (Ganglberger). In an interval at **4.15,** Market Prices. **4.40,** Talk: The New Spirituality—the way to a New Mankind. **5.0,** Programme to be announced. **5.40,** Programme Announcements and Market Prices. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** News. **7.10,** Concert by Silesian Philharmonic Orchestra, conducted by Herman Behr, relayed from the Konzerthaus; Soloist, Mia Neusitzer-Thönissen (Soprano): Concerto grosso No. 2 in B (Handel); Cantata for Soprano and Orchestra, Lucretia (Handel); The Eroica Symphony, Op. 53 (Beethoven). **9.0,** See **Munich. 9.20,** Time, Weather, News and Programme Announcements. **9.50,** Wireless Technical Talk. **10.0,** Gramophone Records of Popular Music. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News and Talks. **6.0,** See **Prague. 6.25,** Concert in Honour of Otakar Sevcik. The Station Orchestra, conducted by Bakala. Soloist: Josef Muzika (Violin); Introductory Talk; Overture, Op. 38 (Kallivoda); Violin Concerto, Op. 53 (Dvorak); Czech Dances and Songs (Sevcik). **8.10,** Recitations. **8.35,** Pianoforte Recital of Old and New Austrian Dances. **9.0,** See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Records. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans. Circus March (Guillemyn); Waltz from the Dollar Princess (Fall); Simple aveu (Thomé); Selection from Gipsy Love (Lehár); Violin Solo: Schön Rosmarin (Kreisler); Selection from Hans the Flute Player (Ganne); Serenade (Cacciali); Selection from Troublez-moi (Moretti). **5.0,** Concert by the Radio Orchestra, conducted by Walpot. French Military March (Saint-Saëns); Waltz, Unter den Linden (Joh. Strauss); Overture, Cigale et Magali (Casadesus); Intermezzo from Lika (Van Oost); Selection from Mirella (Gounod); Clarinet Solo: Variations on Themes from Marlborough (Paradis); Love Song (Calndi); Extracts from Scènes pittoresques (Massenet). **6.0,** Talk: The Art of Speaking. **6.15,** Nocturne from La Navarraise (Massenet). **6.20,** Gretry Concert, with Commentary. **7.15,** Gramophone Records. Introduction and Allegro for Harp (Ravel); Kamarinskaya (Glinka). **7.30,** Film and Theatre Review. **8.0,** Concert by the Radio Orchestra, conducted by Walpot. Soloist: Suzanne de Gavre (Songs). Sambre et Meuse (Planquette); Overture, Orpheus in the Underworld (Offenbach); Suppé Potpourri (Michaelov); Songs with Orchestral Accompaniment; March of the Tin Soldiers (Jessel); Slav Rhapsody No. 2 (Friedemann); Selection from Tosca (Puccini); Songs with Orchestral Accompaniment; Perpetuum Mobile (Joh. Strauss); Violin Solo: Czardas (Monti); Waltz Potpourri (Robrecht). In the interval at **8.45,** Talk: Géo Charles, a Belgian Author. **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans. Morning, Noon and Night (Suppé); Ballet Music from Philemon et Baucis (Gounod); Petite Suite No. 2 (Gilson); Scènes napolitaines (Massenet); Liebestraum (Liszt); Reminiscences of a Voyage (Albeniz); Waltz, The Skaters (Waldteufel). **1.0 p.m.,** Le Journal Parlé. **1.10,** Acts I and IV of Manon Lescaut (Puccini) on Gramophone Records. **5.0,** Concert by the Station Symphony Orchestra, conducted by Meulemans. Overture, Der Freischütz (Weber); The Young Shepherd (Marsick); Symphony in E flat (Mozart); Selection from Il Seraglio (Mozart). **5.45,** Programme for Children. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans. Hochzeitszug in Lilliput (Translateur); Selection from The Desert Song (Romberg); In the Steppes of Central Asia (Borodin); Printemps d'amour (Kalkman); Ballet Music from Hamlet (Thomas). **7.15,** Talk: An interview with the Ex-Champion of the World. **7.30,** Le Journal Parlé. **8.0,** Extracts from the St. John Passion (Bach) on Gramophone Records. **8.8,** Act II of De Zaak van Spoel—Radio Play (Dirickx) followed by a Discussion between Listeners. **8.45,** Talk; The Fiscal System. **9.0,** Concert by the Symphony Orchestra, conducted by Meulemans. Overture, Mignon (Thomas); Ballet Music from Faust (Gounod); Two Songs; Scherzo (Marsick); Rondo capriccioso for Violin (Saint-Saëns); Two Songs; Le Carnaval romain (Berlioz). **10.0,** Le Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—**4.0 p.m.,** Concert by the Station Orchestra: Florentine March (Fucik); Valse appassionata (Ketelbey); Overture, Rosamund (Schubert); Symphonic Andante (Clenus); Intermezzo (Elliot); Minuet (Sgambati); Ballet Suite from La Source (Delibes); Potpourri, Fortissimo (Kálmán); Oriental Piece (Lindemann). In an interval at **5.0,** Radio Journal and Recital of Greek Songs. **7.0,** Quartet in D (Borodin), by the Theodoresco Quartet. **7.30,** Talk. **7.45,** Song Recital: Die Wasserflut (Schubert); Romance (Rubinstein); Aria from Cavalleria rusticana (Mascagni); La Danza (Rossini). **8.15,** Pianoforte Sonata in B Flat, Op. 106 (Beethoven). **8.45,** Radio Journal. **9.0,** Romanian Music by the Station Orchestra

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **340 metres** from **7.50 p.m.** till Close Down. **4.0 p.m.,** Concert by the Georg Guttenberg Chamber Orchestra. **5.10,** German Lesson. **5.40,** Violin Recital by Eugen Szánto. **6.15,** Talk. **6.45,** Gramophone Music. **7.30,** News. **7.50,** Talk: Opera in Hungary. **8.5** (approx.), Concert by the Royal Opera House Orchestra, conducted by Dohanyi. In the interval at **8.50,** Weather. **9.50,** Concert by Karl Vere's Cigány Band, relayed from the Britannia Hotel.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY.—11.0 a.m.,** Town Hall Chimes. **11.2 to 1.0 p.m.,** Concert from the Hotel d'Angleterre. **1.50,** Talk for the Housewife. **2.0,** Concert by the Radio Orchestra, conducted by Fritz Mahler: Overture, The Black Domino (Auber); Ballet Music from Orpheus and Euridice (Gluck); Nocturne in C (Haydn); Two Hungarian Dances (Brahms); Scherzo and Wedding March from A Midsummer Night's Dream (Mendelssohn); Reading; Overture, Die Fledermaus (Joh. Strauss); Waltz, The Blue Danube (Joh. Strauss); Selection from La bontique fantasque (Rossini-Respighi); Ballet Music (Fedorov); Spitzentuch-Quadrille (Joh. Strauss); Persian March (Joh. Strauss). **4.0,** Gramophone Music: Kreuzzug (Schubert); Selection from The First Act of Parsifal (Wagner); Aria from the First Act of Der Rosenkavalier (Richard Strauss); Pianoforte Solo: Danse rituelle du feu (Falla); Romance from L'Africaine (Meyerbeer); Vorrei morire (Tosti); Caro mio ben (Giordano); Crucifix (Rosier and Fauré). **4.30,** Exchange and Market Prices. **4.45,** Talk: European Economics. **5.15,** Elementary English Lesson. **5.45,** Weather. **5.54,** Announcements of the Workers' Radio Society. **6.0,** News. **6.15,** Time Signal. **6.30,** Concert of Old Viennese Dances by the Radio Orchestra, conducted by Fritz Mahler: Minuet and Anglaise (Dittersdorf); Two Dances in Ländler Style (Mozart); Six Contredanses (Beethoven); German Dances (Schubert, arr. Webern); Military March, No. 3, in E Flat (Schubert); Waltz, Die Schönbrunner (Lanner). **7.0,** Town Hall Chimes. **7.2,** Discussion: Sports and Sports Societies, relayed from the University. **9.15,** News. **9.30,** Festival Programme from the Lorry Etablissement.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**6.5 p.m.,** Book Review. **6.20,** Miscellaneous Items. **6.25,** Illustrated Lecture Recital: Popular Polish Music relayed from **Poznan, 897 kc/s, 334.4 metres. 6.45,** Programme Announcements. **6.50,** See **Warsaw. 9.15,** Sports Notes. **9.25,** Light Orchestral Music, relayed from the Pavilion Restaurant. **10.30** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I. Orchestral Concert. Signature Tune; Pulcinello (Alleter); Charming Episode (Ormandy); The Way to the Heart (Lincke); Guitar Solo: Feeling my Way (Lang-Kress); Her first Dance (Heykens); A Radio Roundabout (Noacx); Pianoforte Solo: When Day is done (de Sylva); The Old Spinning Wheel (Hill). Part II. Dance Music. Oh, Johanna!; The Last Round Up; My Own; Goofus; Since Maggie became Margaret; Dinner at Eight; Tick, Tock; Vilia (Lehár); Signature Tune. **12 Noon,** Programme in French. **4.30 to 6.0 p.m.,** Programme in English by the I.B.C. **4.30,** The I.B.C. Nursery Corner with Columbus and Belinda; Birthday Greeting; Trumpets. **4.40,** Orchestral Concert for Chichester and Bognor. Signature Tune; The Night by the Sea; Selection from The Cat and the Fiddle (Kern); Moonlight at Sanssouci (Rotter); Pianoforte Solo: Just humming along (Ewing); Ginger Snaps (Bourdon); Waltz, Artist's Life (Joh. Strauss); Stephanie Gavotte (Czibulka); Dance of the Nymphs (Birch); Violin Solo: An Old Viennese Dance (Vogleju); The Busy Bee (Bendix); Gridiron Club March (Sousa). **5.20,** Gramophone Concert for Hastings and Eastbourne Listeners. Selection from The Chocolate Soldier (O. Straus); Since you went away (Johnson); The Bing Boys are here (Grey); There's a Cabin in the Pines (Hill); Valse triste (Sibelius); Coney Island Washboard; Tony's Wife (Adamson); Putting it on (Boswell); Whistling under the Moon (Hargreaves); The Organ Grinder (Stept); Selection from The Quaker Girl (Monckton); Signature Tune. **6.0,** Programme in French. **10.0** (approx.), till Close Down, Programme in English by the I.B.C. **10.0,** Dance Music. Signature Tune, The Bells of Normandy; The Wedding

of Mr. Mickey Mouse; Cecilia Mia; How could we be wrong?; Good-night Little Girl of my Dreams; Happy Ending; My Moonlight Madonna; Shadows on the Swanee; Oh! Johanna; Love Songs of the Nile; From me to you; I'll show you off; Lazybones; Sing Another Line; Wood Violets Waltz; What a Perfect Combination; Solitario. **11.0**, Talkie Time. Tunes from the Talkies and Shows. Signature Tune, Sittin' in the Dark; The Shadow Waltz (Dubin); But for you (Hollander); Selection from This Week of Grace (Parr-Davies); Pretty One; Selection from Forty-Second Street (Dubin); How could we be wrong? (Porter); Vilia (Lehár); Live, love and laugh (Heymann); Signature Tune, Sittin' in the Dark. **11.30**, Club Concert for Ely Listeners. Part I. Military Music. Signature Tune, The Chun Song; Come back to Erin; Serenade (Heykens); The Wedding of the Rose (Jessel); Light of Foot (Latann); Song, Tommy Lad (Margetson); The Bullfighters' March (Kottaun); Song, My Old Shako (Trotère); Selection from Maritana (Wallace). **12.5 a.m. (Tuesday)**, Late News Bulletin in English. **12.10** (approx.), Club Concert, Part II. Tick, Tock (Vienna); Mary Rose (Parr-Davies); Dinner at Eight (Fields); I've found the Right Girl (Lupino); Lover (Rodgers); Signature Tune. **12.30**, Dance Music. Egypt; Trouble in Paradise; Mademoiselle; Sundown in a Little Green Hollow; Vilia; Learn to croon; The Last Round Up; Reflections in the Water. **1.0**, Dance Music; Signature Tune, Bells of Normandy; Morning, Noon and Night; Don't blame me; P.C.123; Mi Amor Esta en el Valle; My Lucky Day; Sweetheart Darlin'; I live for Love; With you here and me here; Isn't this a Night for Love; Dawn in Montmartre; If you'll say Yes Chéric; Moths around the Candle Flame; Sweet Dreams Pretty Lady; Happy as the Day is long; Ding, Dong, Ding; Aloha Oe!; Signature Tune. **2.0**, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.**, Time and News. **12.25**, Local News and Weather. **12.35**, See **Langenberg.** **1.40**, Recital of Songs by a Male Voice Quartet. **2.30**, Weather Report. **2.40**, Time and Exchange. **3.0**, See **Langenberg.** **5.0**, See **Stuttgart.** **5.35**, S.O.S.—a Sketch (Arthur Berkun). **5.50**, Weather, News, Exchange, Programme Announcements and Time Signal. **6.0**, Transmission for all German Stations, relayed from **Leipzig.** **7.0**, Topical Talk. **7.10**, Debit and Credit—Dialogues on Commercial Life. **7.50**, Concert of Music by Mozart, Beethoven, Weber and Wagner, by the Station Orchestra, conducted by Hans Rosbaud. **9.0**, Time and News. **9.20**, See **Stuttgart.** **9.30**, Local News and Weather. **9.40**, See **Langenberg.** **12 Midnight**, Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—**6.0 p.m.** Transmission for all German Stations relayd from **Leipzig.** **7.0**, Topical Talk. **7.10** (from **Flensburg**), 'Cello Concerto in A Minor (Schumann) by the Flensburg Orchestra, conducted by Röder with Adolf Steiner ('Cello) relayed from the Deutsche Haus. **7.45**, News. **8.0**, Radio Pictures in Dialect. **9.0**, News. **9.10** (from **Kiel**), Orchestral Concert conducted by Hans Döring: Overture, Jean de Paris (Boieldieu); Selection from William Tell (Rossini); Waltz, The Blue Danube (Joh. Strauss); Romance from and Prelude to King Manfred (Reinecke); Overture to an Operetta (Lincke); Heinzelmännchans Wachtparade (Noack); Russian Suite (Bantock); Intermezzo from Der Bajazzo (Czibulka); Gallop (Waldteufel); March, Fest und treu (Donath).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**12.5 to 1.30 p.m.**, Gramophone Concert: Overture, Rienzi (Wagner); Songs: (a) Knowst thou the Land, from Mignon (Thomas), (b) Song from Faust (Gounod); Selection from Die Ægyptische Helena (Richard Strauss); Choir: (a) Jubelhymne, 1933 (Fibich), (b) Hymn (Thiel); Overture, Semiramis (Rossini); Musik der Welt—Music for Choir, Organ, Violin, Trumpet, Clarinet, Xylophone, Vibraphone and Hawaiian Guitar; Old Vienna in Song and Dance (Pachernegg); Cossack Choir: (a) Eintönig klingt das Glöcklein, (b) Stenka Rasin; Von Lenz und Liebe (Körner); Der Gott der Eisen wachsen liess (Brase); Sag Kamerad zu mir (Rust). In the intervals at **12.20** and **1.0**, News. **1.40**, Talk for Girls. **2.0**, Market Prices. **2.30**, Programme for Children. **3.0**, Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Lurline (Wallace); Selection from Le Postillon de Longjumeau (Adam); Ballet Divertissement (Blättermann); Waltz, Nachtfalter (Joh. Strauss); Almeria (Mahy); Gipsy Idyll (Ferraris); Memories of Cairo (Armandola); Selection from Eva (Lehár); Overture, Zampa (Hérold). In the interval at **3.50**, Review of Books. **4.55**, Elementary English Lesson. **5.15**, Market Prices. **5.25** (from **Danzig**), Talk: The History of the Cistercian Abbey at Oliva. **5.50**, Weather. **6.0**, Transmission for all German Stations, relayed from **Leipzig. 7.5 to 9.0**, See **Berlin (Deutschlandsender).** **9.0**, News.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.**, and 20 kW. from **5.40 p.m.** Programme of the Workers' Radio Society (V.A.R.A.).—**10.40 a.m.**, Talk for Women. **10.50**, Concert by the Small U.A.R.A. Orchestra, conducted by De Groot. **11.40**, Gramophone Music. **11.55**, Concert (contd.). **12.40 p.m.**, Light Music by De Fliererfluiters, with Gramophone Interludes. **1.40**, Interval. **2.10**, Schumann Lieder Recital by Julie de Stuers (Mezzo-Soprano): Widmung; Der Nussbaum; Lied der Braut; Ich kann's nicht fassen; Du Ring am meinem Finger; Aufträge; Volksliedchen; Dein Angesicht; Waldesgespräch; Frühlingsnacht. **2.40**, Recitations. **3.10**, Gramophone Music. **3.22**, Song Recital by Marcus Plooyer. **3.40**, Talk on Fashions. **4.0**, Gramophone Music. **4.10**, Programme for Young People. **5.0**, Concert of Light Music: The Girls of America (Duganne); Wine, Woman and Song (Joh. Strauss); Melody (Ackermans); Rosita (Dupont); Sierra Nevada (Lucchesi); Tango (Filipucci); Melody; Selection from The Merry Widow (Lehár); Diamenten und Perlen (Dostal); Berceuse (Godard); Babillage (Gillet); Two Legends (Külmán); Bell Dolores (Lesso-Valerio); Mein Schatz tanzt so gern (Grothe). **6.10**, Medical Talk. **6.50**, Liszt Pianoforte Recital by Leo Kestenberg: Le Chapelle de Guillame Tell; Variations on a Theme of Bach; Franciscan Legend No. 2, St. François d'Assise. In the Interval at **7.10**, Recitations. **7.40**, S.O.S. Messages. **7.42**, News. **7.50**, Concert by the V.A.R.A. Orchestra, conducted by Feudler: Wasserouvertüre (Telemann-Feudler). **8.10**, Violin and Pianoforte Recital: Suite in the Old Style (Zimbalist). **8.30**, Orchestral Concert (contd.): Prelude (Vredenburgh); Radio Music (Lazar); Violin Concerto in G (Dittersdorf); Symphony in C (Krauss-Fendler). In the Interval at **8.50**, Talk: Feminine Inquisitiveness. **10.0**, Recitations. **10.15**, Dance Music. **10.50**, Organ Music. **11.10**, Gramophone Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50kW. from **3.40 p.m.** Programme of the Christian Radio Society (N.C.R.V.).—**11.40 a.m.**, Police Notes. **11.55**, Gramophone Music. **12.10 p.m.**, Organ Recital by Zwart: Melody (Zwart); Pastorella (Bruggen); In tempo di minuetto (Opstal); Psalm No. 42 (arr. Zwart); Symphony No. 1 (Guilmant); Song (Karg Elert); Quasi Marcia (Karg Elert); Song (arr. Zwart); Toccata (Widor); Pastorale (Widor); Psalm No. 66 (arr. Zwart). **1.40**, Broadcast for Schools. **2.15**, Horticultural Talk. **2.55**, Dressmaking Lesson. **3.25**, Interval. **3.40**, Bible Reading with Songs and Organ Solos. **4.40**, Gramophone Music. **4.55**, Recital of Sacred Songs, with Violin Solos. **5.55**, Gramophone Music. **6.10**, Answers to Correspondence. **6.40**, Police Notes. **6.55**, Religious News. **7.10**, Answers to Correspondence (contd.). **7.40**, Concert by an Accordion Band: March (Cicre); In a Persian Market (Ketelbey); Song of the Flowers (Lange); Gramophone Records; Parade of the Tin Soldiers (Jessel); Overture, Martha (Flotow); The Mill in the Black Forest (Eilenberg); Through Night to Light (Laukien). **8.40**, Talk. **9.10**, News. **9.20**, Organ Recital by Schoonderbeek: Prelude and Fugue in C (Böhm); Choral-Partita (Walthar); Toccata and Fugue in F (Bach); Sonata No. 2 (Mendelssohn); Passacaglia Choral and Fugue (Wolf). **10.20**, Gramophone Concert. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.**, News, Amusement Guide, Financial Notes and Racing Results. **8.10**, Sports Notes. **8.25**, Light Music. **8.45**, News and Weather. **9.0**, A Louer Meublé (To Let—Furnished)—Comedy in One Act (G. d'Hervillez).

KALUNGBORG.—See **Copenhagen.**

KATOWICE

734 kc/s, 408 metres; 16 kW.—**6.0 p.m.**, Announcements, and Popular Music on Gramophone Records. **6.10**, Talk. **6.25**, Illustrated Talk on Popular Polish Music, relayed from **Poznan, 897 kc/s, 334.4 metres. 6.45**, See **Warsaw.** In the interval at **8.0**, Reading, relayed from **Wilno, 530 kc/s, 566 metres. 9.15** till Close Down, See **Warsaw.**

KAUNAS

155 kc/s, 1,935 metres; 7 kW.—**6.0 p.m.**, Time, Weather, Announcements, Exchange and Programme Announcements. **6.30**, Concert: Handel Potpourri (arr. Urbach); Violin Solo: Largo and Allegro (Bach); Mozart Potpourri. **7.0**, Lithuanian Lesson. **7.30**, Duets. **7.50**, Review of Foreign Politics. **8.10**, Violin and Pianoforte Sonata (Brahms). **8.40**, Reading (Galsworthy). **8.55**, Sports Notes. **9.0**, Concert: Czardas (Hubay); Capriccio, Diavoletta (Lindemann); Waltz (Moszkowsky); Selection from Si j'étais roi (Adam). **9.30** (approx.), Close Down.

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**11.0 a.m.**, Concert by the Fröhliche Fünf. Waltz, Im Reiche der Venus (Gröschel); Leggenda d'amore (Becce); Tanzweise (Derksen); Elfengeflüster (Heykens); Volksliedchen und Märchen (Komzak); Waltz, Künstlerleben (Joh. Strauss); Gramophone Music. **12.15 p.m.**, See **Frankfurt.** **12.25**, News and Weather. **12.35**, Choral and Soloist Concert. **1.30**, Meat Market Prices. **2.0**, Gramophone Music. **2.30**, Exchange. **2.50**, Political Announcement. **3.0**, Concert by the Station Orchestra, conducted by Otto Julius Kühn, the Station String Quartet and the Station Choir. Soloists: Egebert Grape (Pianoforte) and Glahe and Hartung (Oboe). Overture, Cosi fan tutte (Mozart); Concert Rondo in D for Pianoforte (Mozart); Slav Rhapsody (Dvorák); Waltz, Entr'acte from Donna Diana (Reznicek); Hungarian Fantasia (Liszt); Wedding Procession from The Golden Cockerel (Rimsky-Korsakov); Waltz Elegy and Waltz from the Serenade for String Orchestra (Tchaikovsky); Two Choral Pieces (Unger): (a) Pilger, (b) Nachts; Duet for two Oboes (Ferling); Melodies for Choir (Mengelbier): (a) Am Morgen, (b) Im grünen Wald, (c) Die Grete mit der Harke; Dumky Trio (Dvorák); Allegro moderato à la polka (Smetana). **5.0**, See **Stuttgart.** **5.35**, Reading from the Works of Wilhelm von Polenz. **5.50**, News. **6.0**, Transmission for all German Stations, relayed from **Leipzig.** **7.0**, See **Frankfurt.** **9.20**, See **Stuttgart.** **9.30**, News, Weather and Sports Notes. **9.40**, Light Music. **10.0**, Dance Music by the Station Orchestra. **11.0**, Chamber Music on Gramophone Records. Trio in G for Violin, 'Cello and Pianoforte (Haydn); Trio in B flat for Clarinet, 'Cello and Pianoforte (Beethoven); Divertissement No. 6 for Two Flutes, Five Trumpets and Four Kettle Drums (Mozart); String Quartet in C Op. 20 No. 2 (Haydn). **12 Midnight**, Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**12.30 p.m.**, Concert of Schrammel Music. **1.15**, News. **1.30**, Notes on Art. **1.40**, Programme to be announced. **2.0**, Review of German Books—Eulenspiegel. **2.35**, Exchange. **3.0**, See **Breslau.** **4.30**, Topical Talk. **4.50**, Cigány Music on Gramophone Records. **5.20**, Talk: The East German Provinces. **5.40**, Exchange and News. **6.0**, Transmission for all German Stations: Schubert's Lonely Youth—Musical and Literary Programme (arr. Heinrich Werlé); Claire Spengler (Soprano), and Hans Fleischer (Tenor). Tenor Solo, with String Quartet: Hoffnung; Readings: (a) Schubert's First Letter to his Brother Ferdinand, (b) An Entry in his Diary in September, 1816; Trio for Women's Voices, Flute, Violin, and 'Cello: Das Leben; Reading: A Letter to Goethe from Josef von Spain, enclosing a Volume of Songs; Tenor, Flute, Clarinet, and Strings: Der Moudabend; Reading: An Entry in his Diary in September, 1816; Soprano, Violin, Viola, and 'Cello: Erntelied; Reading: Mozart's Music—an Entry in his Diary in September, 1816; Tenor, Oboe, and String Quartet: Geheimnis an Franz Schubert; Two Women's Voices, Flute, and String Quartet. Auf der Berge freien Höhen; Tenor, Choir, and String Quintet; An die Freude; Reading: An Allegory (1822); Baritone, Clarinet, Viola, Violin, and 'Cello: Abendlied. **7.0**, Dance Music by the Emdé Orchestra. Soloist: Erwin Hartung (Tenor). **9.0**, News. **10.0**, Concert of Contemporary German Music. **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**6.0 p.m.**, Gramophone Music. **6.30**, News for Abroad. **7.0**, Variety Programme. **8.30**, News and Weather. **8.45**, Concert by the Station Orchestra.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—Austrian Evening. **7.0 p.m.**, Selection from Der Bettelstudent—Operetta (Millöcker), on Gramophone Records. **7.30**, Concert of Viennese Music by the Station Orchestra, conducted by Henri Pensis. Soloist: André Cassedanne (Violin); The Unfinished Symphony (Schubert); Violin Concerto (Mozart). **8.20**, A Musical Legend by Eva Siewert. **8.30**, Recital of Viennese Songs by Jenny Jungbauer. **8.50**, News in French. **9.0**, Concert of Austrian Music by the Radio Orchestra, conducted by Henri Pensis. **9.50**, News in German. **10.0**, Gramophone Concert of Variety Music. **10.20**, Dance Music by the Radio Jazz Band, conducted by Ferry Jusa.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.**, Announcements. **6.15**, Esperanto Talk. **6.25**, See **Warsaw.** In the interval at **8.0**, Reading, relayed from **Wilno, 530 kc/s, 566 metres. 10.5**, Gramophone Records. **10.30** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—**7.40 p.m.**, Radio Gazette for Lyons and the South-East. **8.30**, Orchestral Concert Symphony (J. C. Bach); Peer Gynt Suite (Grieg); Overture on Jewish Themes (Prokofiev); Danses villageoises (Grétry); Largo for Strings (Handel); Le Festin de l'Araignée (Roussel); La pendola armoniosa (Pick-Mangiagalli); Eglogue (Rabaud); Prélude, Cortège et Danse (Debussy); Ballet Music from Henry VIII (Saint-Saëns). After the Concert: News.

MADRID

ARANJEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.**, Concert of Popular Music. **10.45**, Radio Chroniele. **11.0**, Programme for Catalans Abroad. **12 Midnight** till Close Down, I.B.C. Concert of Light Music. Song of the Vagabonds (Friml); My Beautiful (Rondot); Oh, Sailor Behave (Dubin); The Wave (Metra); Black Eyes (Traditional); Dreams on the Ocean (Gungl); There's a House on a Hill (Meyer). **12.30 a.m. (Tuesday)**, I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.**, Chimes, Exchange, Topical Talk and Dance Music. **8.15**, Topical Review. **8.30** (approx.), Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.30 p.m.**, German Transmission: Report from a Printing Works. **6.0**, See **Prague.** **7.10**, Jazz Music on Gramophone Records. **7.40**, See **Prague.** **8.10**, Concert by the Station Orchestra, conducted by Musil. **9.0** till Close Down, See **Prague.** **9.15** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.**—**10.45 a.m.**, Weather. **1.45 p.m.**, Weather. **3.0**, Concert of Popular Russian Music. **3.0**, German Lesson. **3.30**, Literary Programme followed by Sketch. **4.30**, Gipsy Songs and Dances—Programme of Guitar and Accordion Music with Songs. **5.30**, Concert of French, Italian and Spanish Chamber Music. **8.0**, News. **8.30**, Programme Announcements. **8.55**, Chimes from the Red Square. **9.5**, Press Review. **10.0**, Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**3.20 p.m.**, Orchestral Concert, conducted by Erich Kloss: Overture, Sylvana (Weber); Movement from the Octet (Schubert); Selection from The Bartered Bride (Smetana); Waltz, Paysage d'automne (Waldteufel); Schwarzwald-Suite (Thiele); Selection from I promessi sposi (Ponchielli); Liebelei (Steck), Gallop, Marksrakete (Leuschner). **4.45**, Dialogue on the Olympic Games. **5.5**, A Humorous Radio Sequence with Music (arr. Hans and Ilse Fitz). **5.25**, Review of Books. **5.45**, Time, Weather and Agricultural Notes. **6.0**, Transmission for all German Stations, relayed from **Leipzig.** **7.0** (from **Nürnberg**), Variety Programme. **7.50**, Die Teufelsbraut—A Tragi-Comedy (Franz Kranewitter), with Music by the Small Station Orchestra, conducted by Erich Kloss. **9.0**, Austria . . . **9.20**, Time, Weather, News and Sports Notes.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

NOV. 13th MONDAY *continued*

NOV. 13th MONDAY continued

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres,** and **Jelöy LCL, 6,990 kc/s, 42.92 metres.**—**4.0 p.m.,** Chamber Music by the Radio Ensemble, conducted by Oscar Gustavson. **5.0,** German Lesson. **5.30,** Theatre Notes. **6.0,** Announcements, Weather and News. **6.30,** Talk arranged by the Bergen Museum: Earthquakes and their Cause. **7.0,** Time Signal. **7.1,** Violin and Pianoforte Recital by Henri Marteau and Ivar Johnsen: Sonata for Violin and Pianoforte (Bober); Three Pieces (Bach): (a) Gavotte in E. (b) Andante in C. (c) Prelude in G. **7.40,** Talk and Recitations. **8.10,** Political Review. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Accordion Duets by Sundquist and Hyléa.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Report, Agricultural Notes, Report of the Royal Geographical Society and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Concert of Chamber Music by the Station Quartet and Silvia Delisi (Soprano). **8.45,** Gramophone Concert. **10.0,** Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music. **7.15,** Le Journal Parlé. **7.30,** Jazz Music on Gramophone Records. **8.0,** Talk on Aeronautics. **8.10-8.30,** Interval. **8.30,** A Half Hour of Humour—by Max Régnier and his Singers. **9.0 to 9.20,** Interval. **9.20,** Gala Programme. **10.30,** News.

PARIS

RADIO-PARIS, Call C.F.R., 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** News. **12 Noon,** Gramophone Concert: Giorgina (Bracale); Sentimiento to Gaucho (Canaro); Le long du Missouri (Christiné); Melody (Lehár); Two Songs from Le fils improvisé (Sylviano); Poupées de Paris (Loyraux); Songs: (a) La Legende des flots bleus (Christiné-Delmet). (b) Détresse (Charpentier-Biletta). (c) Tu me dis non (Rosen-Mauprey). (d) Le Raccommodeur de Faïence (Coler). (e) Les Fantoches (Macioccini); Marionetta (Tagini); Pajarito (Linyera); Te fuiste, ja! ja! (Rodrignez); La Muchacha del circo (Mattes); Songs: (a) A présent qu' t' es vieux (Marinier), (b) Etre deux (Matis-Lenoir), (c) Mens (Matis-Lenoir), (d) The Wedding of the Painted Doll (Nacio-Herb Brown); Accordion Solos: (a) Gosse de Paris (Sylviane), (b) Melody; Moss Rose (Bosc); La saison des mimosas (Claret-Gabriello); Duets: (a) Voici mon coeur (Crémieux-Varenne), (b) Rêve de Gueux (Leardy-Verly), (c) La femme qu'on aime (Leardy-Gabriello), (d) Miss Daisy (Bersac); Orchestral Music. In the interval at **1.0,** Exchange and News, and at **1.30** and **2.0,** Exchange. **3.45,** Exchange and Market Prices. **6.20,** Agricultural Talk. **6.45,** Film Review. **7.0,** Book Review. **7.20,** Light Music on Gramophone Records. **7.45,** News and Gardening Talk. **8.0,** Véronique—Opéra-Comique (Messager). In the interval at **8.30,** News, at **8.40,** Review by Reboux, and at **9.15,** News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.,** Musical Originalities, from **New York. 7.30,** KDKA Home Forum. **8.0,** Radio Guild, from **New York. 9.0,** Betty and Bob, from **New York. 9.15,** Programme to be announced. **10.0,** Uncle Tom and Betty. **10.15,** KDKA Kiddies' Club. **10.30,** The Singing Lady, from **New York. 10.45,** Orphan Annie, from **New York. 11.0,** News-Reeler, Pat Haley. **11.15,** Sports and Programme Review. **11.30,** Evensong. **11.45 to 12.45 a.m. (Tuesday), New York** Relay. **11.45,** Lowell Thomas. **12 Midnight,** Amos 'n' Andy. **12.15,** Baby Rose Marie. **12.30.** Potash and Perlmutter. **12.45,** What would you do? **1.0,** Popular Programme. **1.30,** Programme to be announced. **1.45 to 3.30, New York** Relay. **1.45,** Red Davis. **2.0.** Sinclair Minstrels. **2.30,** Melody Moments. **3.0,** Variety Programme.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Bratislava. 3.50,** Programme for Children. **4.5,** Gramophone Records. **4.15,** Talk: School Problems. **4.25,** Gramophone Records. **4.35,** English Lesson for Beginners. **4.50,** Gramophone Records. **5.5,** Agricultural Report. **5.15,** Talk for Workers. **5.25,** News in German. **5.30,** German Transmission: Educational Talk. **6.0,** Time and News. **6.10,** Talk: The Modern House. **6.25,** Reminiscences of Leopold Smid, a popular Cabaret Artist of 1900—Scenes, Monologues and Songs. **7.10,** See **Moravská-Ostrava. 7.40,** Pianoforte Quartet in A Minor, Op. 1 (Suk), played by the Ondricek Quartet and Roman Vesely. **8.10,** Concert by the Station Orchestra. Soloist: Maria Kurenko (Songs). Part I, conducted by Parik. Alleluia (Mozart); Rosina's Aria from The Barber of Seville (Rossini). Part II, Gretchaninov Music, conducted by the Composer. Largo and Gavotte (Gretchaninov); Four Songs with Pianoforte and Flute Accompaniment, the Composer at the Pianoforte; Four Songs with Orchestra: (a) The Dreary Steppe, (b) The Willow, (c) Expression, (d) Berceuse. **9.0,** Time and News. **9.15,** Talk in German: A Reporter in Czechoslovakia. **9.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Geneva**), Gramophone Music. **12 Noon** (from **Geneva**), Financial Notes. **12.10 p.m.** (from **Geneva**), Popular Music on Gramophone Records. **1.0,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0,** See **Schweizerischer Landessender. 5.0** (from **Lausanne**), Book-keeping Lesson. **5.30** (from **Lausanne**), Programme for Children. **5.55** (from **Lausanne**), Italian Lesson. **6.20** (from **Lausanne**), Medical Talk. **6.45** (from **Lausanne**), Talk: The Development of the Swiss Corporations. **7.15** (from **Lausanne**), Talk on the following Transmission. **7.30** (from **Lausanne**), Symphony Concert by the Radio-Suisse Romande Orchestra, conducted by Ansermet, relayed from the Municipal Theatre. Soloist: Elisabeth Rethberg (Songs). Symphony No. 2 in D (Brahms); Song, Ah. Perfido (Beethoven); Symphonic Movement No. 3 (Honegger); Three Symphonic Poems for Voice and Orchestra (Wagner): Prelude and Death of Isolda, from Tristan and Isolda (Wagner). In an interval at **8.30** (approx.), News and Weather. **9.30** (aprox.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**8.0 p.m.,** Musical Programme. **8.10,** Weather. **8.20,** Musical Programme and Announcements. **8.35,** Song Recital. **9.0,** Chimes, followed by Popular Music by the Radio Quartet. **9.30,** Reading. **10.0,** News. **10.30,** Selection from Rosamunde (Schubert), on Gramophone Records.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**6.5 p.m.,** Dialogues and Light Music. **6.45,** Dialogues. **7.0,** News. **7.25,** Gramophone Records. **7.30,** Dialogue. **7.45,** Till Eulenspiegel's Merry Pranks (R. Strauss), on Gramophone Records. **8.0,** Weather and News. **8.20,** Duets on Gramophone Records.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres;** and **2RO** from **7.45 p.m.**—**12 Noon to 1.15 p.m.,** Gramophone Records of Opera and Variety Music. In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.55,** Giornale Radio and Exchange. **4.10,** Weather. **4.30,** Concert by the Rome Quartet, relayed from the Royal Philharmonic Academy. **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Dopolavoro Notes and Tourist Report. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time and Announcements. **7.5,** Song Recital by Elena Cheli (Soprano). **7.30,** Giornale Radio and Sports Notes. **7.45,** Concert conducted by Ernesto Abbate: Marcia patetica in D Minor (Abbate); Selection from Il piccolo Marat (Mascagni); Overture, Norma (Bellini). After the Concert, Humorous Talk. **8.15** (approx.), Concert of Light Music, conducted by Culotta. Talk in the interval. **10.0,** Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.**—**7.30 p.m.,** Revolving Stage, from **New York. 8.0,** Health Hunters, Sketch. **8.15 to 8.30** (approx.), Soloist, from **New York. 12.45 a.m. (Tuesday),** Stock Reports. **1.0,** News of the Day, Poetry and Historical Notes. **1.30 to 4.0, New York** Relay. **1.30,** String Symphony. **2.0,** A and P Gypsies. **2.30,** Ship of Joy. **3.0,** Contented Programme. **3.30,** K-7 Secret Service Spy Story. **4.0,** Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **11.0** (from **Basle**), Gramophone Music. **11.29,** Time Signal from Neuchâtel Observatory. **11.40** (from **Basle**), Gramophone Music (contd.). **12.25 p.m.** (from **Basle**), Time, Weather, and Exchange. **12.30** (approx.) **to 2.30,** Interval. **2.30** (from **Basle**), Programme for Women. **2.59,** Time Signal from Neuchâtel Observatory. **3.0** (from **Basle**), Concert by a String Quartet. **4.0,** Gramophone Concert of Swiss Music. **5.0** (from **Basle**), Light Music on Gramophone Records. **5.30** (from **Zürich**), Programme for Children. **6.0,** Time and Weather. **6.5** (from **Zürich**), Gramophone Music. **6.20** (from **Zürich**), English Lesson. **6.50** (from **Zürich**), Concert by the Radio Orchestra. **7.30** (from **Zürich**), Talk: The Development of Architecture. **8.0,** Weather and News. **8.10** (from **Zürich**), Schubert Symphony Concert, with Commentary. **9.25** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**12 Noon to 12.30 p.m.** (from **Göteborg**), Broadcast for Schools. **4.5,** Light Music by a Balalaika Quintet and Igor Miltschanov (Songs). **4.45,** Gramophone Music. **5.45,** German Lesson. **6.15,** Weather and News. **6.30,** Recital by Patrik Vretblad (Organ). Margareta Hügfors (Songs), and Jannie Moreau (Harp). Organ Solo: Allegro from the Symphony No. 6 (Widors); Song with Harp Obbligato: Repentir (Gounod); Andante from the Organ Sonata (de la Tombelle); Song with Harp Obbligato: Agnus Dei (Bizet); Organ Solo: March on a Theme of Handel (Guilmant). **7.15,** Talk on Astronomy: The Milky Way, relayed from **Malmö, 1,301 kc/s, 230.6 metres. 7.45,** A Visit with the Microphone. **8.45,** Weather and News. **9.0,** Light Music by the Septiman String Ensemble: Scandinavian March (Torjussan); Overture, Queen for a Day (Adam); Rhapsody (Sven Sköld); Minuet in the Old Style (Ankerstjerne-Bertelsen); Serenata (Kallstenius); Moment musical (Schubert); Pavane (Ravel); Fascination (Marchetti); Melody (Hansson); Piece (Winter). **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Gramophone Music. **12.45 p.m.,** News. **1.0,** Time and Exchange. **1.5,** Gramophone Music. **2.0,** Interval. **5.0,** Orchestral Concert, conducted by Roskam: March, Vindobona (Komzak); Waltz Intermezzo (Translateur); Les fueilles qui tombent (Delmas); Overture, Pique Dame (Suppé); Selection from L'amour masqué (Messager); Soleil couchant (Brüsselmans); Waltz, Fontaine lumineuse (Waldteufel); Dance (Razigade); Fantoches et pantins (Razigade); March (Léarsi). **6.0,** Fortnightly Review of Literature. **6.15,** Talk. **6.30,** Orchestral Concert, conducted by Maurice de Villars: Overture, Preciosa (Weber); Orchestral Suite, En camargue (Delmas); Selection from Frederica (Lehár); Romance (Svendsen); Hungarian Dances (Brahms). **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German and Lottery Results. **8.30,** Concert by the Cercle artistique de Pest, relayed from Nancy: Organ Solos: (a) Sœur Monique (Couperin), (b) Theme with Variations (Ropartz). Tenor Solos: (a) Aria from Don Giovanni (Mozart), (b) Invitation au voyage (Duparc). Pianoforte Solos: (a) Berceuse (Chopin), (b) Waltz in E minor (Chopin). Violin Solos: (a) Chanson triste (Duparc), (b) Si mes vers avaient des ailes (Hahn). Items in Lorraine Dialect by Mme. Hanus. Concerto in E minor for Two Violins (Bach). Tenor Solos: (a) Notre amour (Fauré), (b) A un ami (Bretagne). Pianoforte Solos (Debussy): (a) Bruyères, (b) Ondine, (c) Feux d'artifices. Violin Solo: Romance from Othello (Verdi). **10.30** (approx.), Press Review.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.25 p.m.,** Local News and Weather. **12.35 to 1.30,** See **Langenberg. 2.0,** German Chamber Music for Violin and Pianoforte by Schumann, Schubert, Dvorák and Reger. **2.30,** Talk: The Bavarian Forests. **3.0,** See **Langenberg. 5.0.** French Lesson. **5.20,** Talk, with Gramophone Illustrations: The Oldest Instrumental Music of Eastern Asia. **5.35** (from **Mannheim**), Talk: Ready Reckoning. **5.50,** Time and Agricultural Notes. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** See **Frankfurt. 9.20,** Topical Talk. **9.30,** Local News, Weather and Sports Notes. **9.40** (approx.) **to 12 Midnight,** See **Langenberg. 12 Midnight,** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Opera Music: Entry of the Gods from The Rhinegold (Wagner); Coriolanus Overture (Beethoven); Selection from The Tales of Hoffmann (Offenbach); Aria from Romeo and Juliet (Gounod); Quartet from Manon (Massenet); Aria from Thaïs (Massenet). **6.45,** Accordion Music. **7.0,** Chansonnettes. **7.15,** News. **7.30,** Violin Recital: Elegy (Massenet); I tuoi occhi (Bonincontro); Waltz in A (Brahms); Dance (Dalcroze). **7.45,** Music by a Viennese Orchestra. **8.15,** Music from Sound Films. **8.30,** Orchestral Music. **8.45,** Operetta Music. **9.0,** Concert by the Station Orchestra, conducted by Espy: Overture, Prometheus (Beethoven); Minuet (Bolzoni); Suite, Algerian Nights (Grech); Selection from Tosca (Puccini); Melody, March of the Tin Soldiers (Pierné); Selection from Comte Obligado (Moretti); Czardas No. 8 (Michiels). In the Interval, Opera Music: Arias from Lohengrin (Wagner), Figaro (Mozart), and The Valkyrie (Wagner); Waltz from Faust (Gounod). **10.15,** News. **10.30,** Concert for Listeners in Morocco: Light Music and Military Music. **11.0,** Concert: Forest Murmurs (Wagner); Aria from Madame Butterfly (Puccini); Fascination (Marchetti); Melody (Porot); Tout est permis quand on rêve (Heymann). **11.15,** Dance Music. **12 Midnight,** News and Weather. **12.5 a.m.,** (Tuesday), Light Music. **12.15,** Orchestral Music. **12.30,** Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.,** Balalaika Concert from the Cabari di Milano. **5.0,** Weather. **5.40,** Giornale Radio, Dopolavoro Notes, and Gramophone Music. **6.0,** Time, Tourist Talk, and Gramophone Music. **6.10,** Market Prices. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** News. **7.15,** Sponsored Concert. **8.15,** One-Act Comedy. **8.45,** Chamber Music. **9.30,** Dance Music. **10.0,** Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres** (Evening); 10 kW. —**10.0 to 10.15 a.m.,** Religious Information in Italian. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 652 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. **12 Noon,** Time and News. **12.10 p.m.,** Gramophone Concert of Classical Music. **1.0,** Interval. **2.0,** Time and Announcements. **2.20,** Talk: A Walk with the Camera through Ober St. Veit. **2.35,** Programme for Young People. **3.0,** Sound Film Music on Gramophone Records. **3.35,** Programme for Young People. **4.0,** Talk: Street Music in Old Vienna. **4.25,** Song and Aria Recital by Josefine Stransky (Soprano). **5.5,** Talk: The Autumn Exhibition in Vienna. **5.25,** Books of Reference in Connection with the Week's Talks. **5.30,** Elementary English Lesson. **6.0,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. In an interval at **6.35,** Time and Announcements. **7.15,** Topical Talk. **7.30,** Concert of Bulgarian Music by the Wiener Symphoniker, conducted by Anton Konrath. Soloist: Pantscho Wladigerov (Pianoforte). **8.45,** News. **9.0,** Variety Music by the Four Funny Fellows, relayed from the Oase, followed by Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5,** Popular Swiss Music on Gramophone Records. **11.30,** Radio Journal. **11.35,** Weather Report. **11.38,** Gramophone Music (contd.). **12 Noon to 2.30 p.m.,** Interval. **2.30,** Economic Notes. **2.40,** Traffic Report. **2.45,** Aviation Report and Anti-Gas Drill. **2.55,** Soprano Solos by Yvonne Printemps on Gramophone Records. **3.15,** Clarinet Recital relayed from **Poznan, 897 kc/s, 334.4 metres. 3.40,** Elementary French Lesson. **3.55,** Dance Music by the Furmanski Jazz Band. **4.50,** Agricultural Correspondence. **5.0,** Talk. **5.20,** Pianoforte Recital by Kurt Engel: Sonata in A, Op. 101 (Beethoven); Novelette in A (Schumann); Widmung (Schumann-Liszt); Hungarian Rhapsody No. 12 (Liszt); March from The Loves of the Three Oranges (Prokofiev); Serenade for the Doll (Debussy); General Lavine (Debussy); Spanish Dance (Falla). **6.5,** Miscellaneous Items. **6.25,** Illustrated Lecture Recital: Popular Polish Music, relayed from **Poznan. 6.45,** Programme Announcements. **6.50,** Radio Journal. **7.0,** The Dollar Princess—Operetta in Three Acts (Fall). In the interval at **8.0,** Reading relayed from **Wilno, 530 kc/s, 566 metres. 9.15,** Sports Notes. **9.25,** Dance Music by the Henri Gold Orchestra, relayed from the Femina Cabaret. In an interval at **10.0,** Aviation Weather Report and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

TUESDAY
NOVEMBER THE FOURTEENTH

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. **6.0,** Programme for Children. **6.40,** News. **7.0,** Gaelic Reading. **7.15,** Poetry Recital. **7.30,** Time Signal. **7.31,** Concert by the Station Orchestra. **8.0,** Variety Programme by the Nono Brothers. **8.25,** Baritone Solos by A. J. O'Farrell. **8.35,** Organ Recital by Eric Crowe, relayed from the Centenary Church, Stephen's Green, Dublin. **9.5,** Baritone Solos (contd.). **9.15,** The Station Orchestra. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Dance Music: I've got to sing a Torch Song; Sweet Dreams; Pretty Lady; Butterflies in the Rain; Lazybones. **9.45,** Dance Music: The River's takin' care of me; Pink Elephants; In Santa Lucia; Dream on. **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: The Wayside Shrine (Sherwood); The Frog King's Parade (Marriott); Song: Wid de Moon, Moon, Moon (Cook); Dance of the Tea Dolls (Schmidt-Hagan); Violin Solo: Valse bluette (Drigo); The Clock and the Dresden Figures; Waltz, Acclamation (Waldteufel). **10.30,** I.B.C. Good-night Melody, followed by News and Weather. **10.40,** Uilleann Pipe Solos by P. Brophy. **10.50,** Traditional Solos by Peter Doyle. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Selection from Mignon (Thomas); Florentine Serenade (Moret); Wedding Procession (Filipucci); Selection from The Valkyrie (Wagner); Melody (Couperin); Gavotte (Konigsberger); Selection from Don Quixote (Massenet). **7.0,** Request Gramophone Records. **7.30,** Exchange and Talk in Catalan. **8.0,** Gramophone Music and News. **8.30,** Educational Programme: Geography and History Lesson. **9.0,** Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. **9.5,** Sponsored Programme. **9.30,** Concert by the Radio Orchestra: Prelude to Act III of Lohengrin (Wagner); Valse triste (Sibelius); Melody (Didier); Love Song (Arensky); Canción a la montaña (Serra); Overture, Euryanthe (Weber). **10.15,** Military Band Concert. In the interval at **11.0,** News. After the Concert, Gramophone Music. **12.0 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Quintet Concert: Nacchere (Lanza); Linda Milonguita (Castegnaro); Fiori e foglie (Profeta); Suite, Impressioni d'Oriente (Amadei); Susanna (Ranzato); La collana di Pasqua (Luporini); Pensiero nostalgico (Wassili); Bella andalusa (Petrini). **3.55** (approx.) to **7.0,** See **Rome.** **7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**11.0 a.m.,** Gramophone Concert of Famous Artists. After the Programme, Weather Forecast. **11.55,** Time. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Gramophone Concert of Opera Music: Overture, Der Wildschütz (Lortzing); Aria from The Barber of Bagdad (Cornelius); Aria from Don Giovanni (Mozart); Trio and Finale to the Third Act from Der Rosenkavalier (R. Strauss); Aria from The Pearl Fishers (Bizet); Aria from Turandot (Puccini); Ballet Music from The Bartered Bride (Smetana); Duet and Quartet from La Bohème (Puccini); Aria from Falstaff (Verdi); Extract from Hansel and Gretel (Humperdinck). **2.0,** Handwork for Young People. **2.30,** Weather and Exchange. **2.45,** Reading (Paul Ernst). **3.0,** See **Leipzig.** **4.0,** Programme for Women. **4.20,** Concert by Hanns Kallies and his Orchestra, with Hanns Schuhard (Songs): Overture, Baron Trenk (Albini); Waltz from Der dumme August (Gfaller); Song from Drei Alte Schachtein (Kollo); Song from La Vallière (Mory); March Song from Das süsse Mädel (Reinhard); Song from the Cousin from Nowhere (Künnecke); Orchestral Fantasia (Corzilius); Selection from The Dubarry (Millöcker-Mackeben). **5.0,** Poems. **5.5,** Dialogue: The German Book Festival. **5.25,** Political Press Review. **5.45,** Weather and News. **6.0,** Transmission for all German Stations: Recital of German Ballads by Adolf Harbich (Baritone) and Wilhelm Kempff (Pianoforte): Baritone Solos: (a) Ritter und Königstochter (Plüddemann), (b) Belsazar (Schumann); Pianoforte Ballads (Brahms); Baritone Solos (Loewe): (a) Prinz Eugen, (b) Der Erlkönig, (c) Der Mummelsee. **7.0,** Talk: The Military Education of German Youth and the Disarmament Conference. **7.10,** Romeo and Juliet—Play (Shakespeare), with Music by Mark Lothar. After the Programme, Concert. **9.0,** Weather and News. **9.45,** Weather. **10.0,** Concert from **Hamburg.** **11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB** and **DJE.—2.45 p.m.,** Sports Talk. **3.0,** Five Songs (Hanneman), by Erika Legart (Soprano), with Violin, Clarinet, Horn and 'Cello accompaniment. **3.15,** Talk. **3.30,** Gramophone Concert. **4.30,** Franz Schauwecker reads from his own Works. **5.0,** Review of Books. **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **7.0,** See **Berlin (Deutschlandsender).** **7.10,** Lottery Announcements. **7.15** till Close Down, Dance Music by Two Bands with Song Refrains by Erwin Hartung. In the intervals, Humorous Dialogues and Lotte Lorring in a Recital of Songs by Alfred von Weigerth with the Composer at the Pianoforte. In the intervals at **9.0,** News, and at **10.0,** Topical Talk. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.3 metres; 14 kW.—**6.0 p.m.,** See **Prague.** **6.10 to 9.0,** See **Brno.** **9.0,** See **Prague.** **10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—11.0 a.m.,** Concert by the Small Silesian Philharmonic Orchestra, conducted by Hermann Behr: Overture, Peter Schmoll (Weber); Serenade in D (Mozart); Reitermarsch (Schubert-Liszt); Waltz, Die Romantiker (Lanner); Overture, The Italian Girl in Algiers (Rossini); Lyric Suite (Grieg); Waltz, Wiener Bonbons (Joh. Strauss). **12.45 p.m.,** Time, Weather, News, and Exchange. **1.10,** Gramophone Music. **1.40,** Programme arranged by the Post Office, with Gramophone Music. **2.0,** Market Prices. **2.25,** Everybody Listen! **2.35,** Programme for Children. **3.0,** Concert from the Café Vier Jahreszeiten. Reading in the interval. **4.50,** Market Prices and Topical Talk. **5.20,** Talk: The Old Testament and Germany of To-day. **5.40,** Programme Announcements and Market Prices. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **7.0,** See **Berlin (Deutschlandsender).** **7.10,** Concert of Chamber Music, conducted by Ernst Prade. **7.40,** Die Anna-Lise—Comedy (Hermann Hersch). **9.0,** Time, Weather, News, Sports Notes, and Programme Announcements. **9.25,** Political Press Review. **9.45,** Light Music and Dance Music from the Hindenburg Café. **12 Midnight,** Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.0 p.m.,** Military Band Concert, relayed from **Znojmo.** **3.55,** A Story of Znojmo in Dialect. **4.5,** A Children's Opera (Albert Pek), relayed from **Znojmo.** **5.0,** News in German. **5.5,** German Programme, relayed from **Znojmo.** **6.0,** See **Prague.** **6.10,** Talks and Readings, relayed from **Znojmo.** In an interval, The Apothecary—Opera in One Act (Haydn), relayed from the Castle Theatre, Valtiec. **9.0,** See **Prague.** **10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Concert. **12.25 p.m.,** Song Recital by Julia Sohots. **12.45,** Gramophone Concert (contd.). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: Serenade and Waltz (d'Indy); Invocation (Ganne); Hymn to the Sun from The Golden Cockerel (Rimsky-Korsakov); Serenade (Hué); Berceuse (Fauré); Andantino (Verhoeven); Kol Nidrei (Bruch); Tarantella (Mawet); Song (Niemann); Canzonetta (Pierné); Jeux d'eau (Rusch). **5.0,** Light Gramophone Music. **5.30,** Programme for Children. **6.5,** News of the Week. **6.15,** Moment Musical (Schubert), interpreted by Five Famous Artists—Leff Pouischnoff, Walter Rehberg and Brailowsky (Pianoforte), Miquel Gandela (Violin), and Pablo Casals ('Cello), on Gramophone Records. **6.30,** Harp Solos by Madeleine Simon: Impromptu caprice (Pierné); La Danseuse à la fontaine (Tournier); Fantasia (Galeotti). **6.45,** Violin and Pianoforte Recital by Marguerite and Flora Gabetti. **7.0,** Request Gramophone Music. **7.15,** Talk for Workers. **7.30,** Talk for Women and Art Notes. **8.0,** Organ and Tenor Recital of Flor Peeters' Music, with the Composer at the Organ: Emile Quaring (Tenor). **8.45,** Talk. **9.0,** Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans; Soloist, Marie-Louise Marichal (the Twelve-year-old Pianist): Petite suite (Debussy); Pianoforte Concerto in D Minor (Mozart); Poèmes roumains (Enesco); Pianoforte Solos: (a) Sarabande and Toccata (Debussy), (b) Air de fête (Jongen); Habanera (Aubert); Ronde Burlesque (Florent Schmitt). **9.55,** Christus Vincit (Liszt). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans. **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert of Variety Music. **5.0,** Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans. **5.45,** Programme for Children. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Cortège oriental (Leemans); Flute Solo: Suite, Conte d'avril (Widor); Grand'maman (Langer); Pianoforte Solo: Petite suite in Old Style (Moorkens); Russian Melody and Minuet (Akimenko); One-Step, Seville (Huppermann). **7.0,** Song Recital by Louis Davids. **7.15,** Talk for Workers. **7.30,** Le Journal Parlé. **8.0,** Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans, with Songs by Marion and Hamilton: Overture, Stradella (Flotow); Selection from Le roi malgré lui (Chabrier); Four Songs; Ballet Music from Carmen (Bizet). **8.45,** Talk. **9.0,** Accordion and Vocal Concert by the Cauherghs Brothers and Marion and Hamilton. **10.0,** Le Journal Parlé.

BUCHAREST

700 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Light Music and Romanian Music by the Mozoi Orchestra. In an interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **7.0,** Song Recital: Two Songs (Kauler); Waltz from Sissy (Kreisler); Song (d'Hardelot); Liebeswalzer (Joh. Strauss-Leo Blech). **7.20,** Symphony Concert by the Station Orchestra, conducted by Otesco. Soloist: Lydia Degon. In an interval at **8.0,** Talk. **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **6.25 p.m.** till Close Down.—**4.0 p.m.,** Flute Recital by Johann Eördögh. **4.30,** Reading. **5.0,** Concert by a Symphony Orchestra of Unemployed Musicians, conducted by Béla Melles. **5.50,** Literary Talk. **6.30,** The Rhinegold—One-Act Opera (Wagner), relayed from the Royal Opera House. After the Opera, Concert by the Alexander Bura Orchestra.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kw. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY.—11.0 a.m.,** Town Hall Chimes. **11.2 to 1.0 p.m.,** Concert from the Bellevue Strandhotel. **2.0,** Concert by the Radio Orchestra, conducted by Emil Reesen. **4.0,** Programme for Children. **4.30,** Exchange and Market Prices. **4.45,** Gardening Talk. **5.15,** Elementary German Lesson. **5.45,** Weather. **5.54.** Report of the Odense Radio Club. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk on Administration. **7.0,** Town Hall Chimes. **7.2,** Concert of Danish Music by the Radio Orchestra, conducted by Launy Gröndahl. **8.0,** Skaansomt—Radio Humoresque (Ladislaus Vadnai). **8.30,** Scottish Folk Songs: Skye Boat Song; He's o'er the Hills; That I loe weel; Charlie is my Darling; The Queen's Mares; Scots wha hae; To the Lord of the Isles; Milking Croon; Ailte. **8.50,** Reading. **9.5,** News. **9.20,** English Gramophone Music: The Hymn that I sang as a Boy; Just a Silver-haired Old Lady; When Mother played the Organ; My Pal. **9.35,** String Quartet in F minor, Op. 5 (Nielsen). **10.5,** Dance Music relayed from the Nimb Restaurant. **11.0,** Time and Chimes from the Town Hall.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**10.30 a.m.** till **12 (Noon),** Programme in English by the I.B.C. **10.30,** The Hoover Broadcast: I'll take an option on you (Rainger); Tea for Two from No No Nanette (Youmans); If you were the only girl in the world; I've got to pass your house (Brown); Forever (Sievier); Poor Butterfly (Bendix); A girl like Nina (Abraham); Xylophone Solo, Dance of the Marionettes (Gaston). **11.0,** Happy Hour. Part I, Military Music: Washington Post March (Sousa); Glow Worm Idyll (Lincke); Cornet Solo, Carnival of Venice (Briccialdi); Selection from The Geisha (Jones); Hobomoko (Recves); Song, The Company Sergeant Major (Sanderson); Valse des Alouettes (Drigo); Old Pañama (Alford). Part II, Dance Music: It's the Talk of the Town; My Mother's Garden (Hanley); Sentimental Gentleman from Georgia (Perkins); Morning, Noon and Night (Swanstrom); Isn't this a night for love? (Burton); 'Twixt the devil and the deep blue sea (Eyton); Louisville Lady (Hill); Don't blame me (Fields); Signature Tune. **12 (Noon),** Programme in French. **4.30 to 6.0 p.m.,** Programme in English by the I.B.C. **4.30,** The I.B.C. Nursery Corner with Columbus and Belinda: Birthday Greetings; Trumpets. **4.40,** Torquay and Exeter Concert: Light Music: Signature Tune, The Night by the Sea; Yip-I-addy-I-ay (Flynn); Serenata (Toselli); Until we meet again Sweetheart; Choral, Japanese Sunset; There's something in your eyes (Grothe); Song, Paradise (Brown); Vienna, City of my Dreams (arr. Reeve); Pianoforte Solo, My heart stood still (Rodgers); Stop the sun, stop the moon (Robinson); My Lady Dainty (Hesse). **5.20,** Plymouth and Devonport Concert. Orchestral Music: Hungarian Dance No. 1 in G Minor (Brahms); Salut d'amour (Elgar); Scherzo from A Midsummer Night's Dream (Mendelssohn); Quartet, A Farewell (Coleman); In the Hall of the Mountain King (Grieg); Autumn (Chaminade); Ballet Egyptien (Luigini); Signature Tune. **5.45,** Concert of Dance Music: Louisville Lady (Hill); Ding, Dong, Ding (Hargreaves); I'll take an option on you (Rainger); Blue Cloud (Ewing). **6.0,** Programme in French. **10.0** (approx.) till Close Down, Programme in English by the I.B.C. **10.0** (approx.), Dance Music: Signature Tune, Bells of Normandy; Trouble in Paradise (Weber); Ding, Dong, Ding (Hargreaves); I'll take an option on you (Rainger); Reflections in the Water (Loeb); Sing another Line (Carson); A Girl like Nina (Hammerstein); Lazybones (Mercer); Avalon (Rose); Come out Vienna; Oh Johanna; Nunca Tango; It's the Talk of the Town; Tick, Tock; Goofus; Hold your Man; Dinner at Eight (Fields); Signature Tune. **11.0,** Talkie Time: Tunes from the Talkies and Shows: Signature Tune, Sittin' in the Dark; Selection, College Humour (Coslow); She's everybody's Sweetheart now (Hargreaves); I live for Love (Abraham); Song, Come out Vienna (Strauss); Dear, Dear (Hart); A nous la Liberté (Auric); Selection from Give me a Ring (Broones); In the Moonlight (Kalmar); Signature Tune. **11.30,** Concert of Light Music arranged by the I.B.C. (Ireland), Ltd.: Signature Tune, Come back to Erin; Danube Waves (Ivanovici); March, The Voice of the Guns; Song, Eileen Alannah (Bonheur); Black Eyes (Ferraris); The Golden Musical Box (Krome); Irish Medley; Song, I give my heart (Leigh); Moonlight on the Alster (Fétras); Signature Tune, Come back to Erin. **12.5 a.m. (Wednesday),** Late News Bulletin in English. **12.10 a.m.** (approx.), Club Concert for Thorney Listeners: Signature Tune, The Chum Song; Dancing Butterfly (Young); Let the World go drifting by (Leon); Adios, Goodbye (Franlan); I've got to pass your house (Brown); The Wedding of Mr. Mickey Mouse (Pola); Sweetheart, Darlin' (Kahn); My Lucky Day (Parr-Davies); My Moonlight Madonna (Fibich); The Last Round Up (Hill); Morning, Noon and Night (Swanstrom); Isn't this a night for love (Burton); Aloha Oe (Liliuokalani); I live for Love (Hammerstein); Signature Tune. **1.0,** Choral Music: Orchestra: Musical Comedy Switch (arr. Hall); Comrades in Arms (Adams); Love and War (Cook); Rosenkavalier Waltz (Richard Strauss); Darkies in the Farmyard; Last night I dreamed of you (Kálmán); Selection from Miss Hook of Holland; When the Lilac Blooms again (Rotter). **1.30,** Hawaiian Music; My South Sea Home; Somewhere in Hawaii (Nelson); Song of the Islands (King); Maui Girl (Libornio); Tomi. Tomi (Trad.); Reef of Stars (Watts); Aloma (Bowers); Amparito (Cramer). **2.0** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** See **Langenberg.** **1.40,** Talk for the Housewife. **2.15,** Weather Report. **2.25,** Time and Exchange. **2.45,** See **Berlin (Funkstunde).** **3.0,** See **Stuttgart.** **5.0,** Italian Lesson. **5.20,** Dialogue: The Life of the Unemployed. **5.35,** Talk: The Heavens in November. **5.50,** Weather, News, Exchange, Programme Announcements, and Time Signal. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **7.0,** See **Berlin (Deutschlandsender).** **7.10,** See **Stuttgart.** **9.0,** Time and News. **9.20,** See **Stuttgart.** **9.30,** Local News and Weather. **9.45,** Light Music. **10.0,** Soloist Concert by Members of the Station Orchestra: Caprice for Clarinet and Orchestra (Gabler); Traurige Weise—for English Horn and String Orchestra (Bodart); Pearls from the Ocean—Fantasia for Trumpet and Orchestra (Hoph); Ehestandsgeplauder—for Oboe and Bassoon (Friedemann); Elegy for Bass Clarinet and Pianoforte; Scherzino, Op. 55, No. 6, for Flute and Orchestra (Andersen); Arabesque No. 1 for Flute and Harp (Debussy); Nocturne for Horn and Orchestra (Rösel); Greek Pirate March for Harp; Concert Piece for Trombone and Orchestra (Graefe); Polka for

Xylophone; Perpetuum mobile (Joh. Strauss). **11.0,** Talk: Dürer's The Four Apostles. **11.14** (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—**6.0 p.m.,** Transmission for all German Stations relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10** (from **Hanover**), Concert of Chamber Music by Lower Early Saxon Composers relayed from the Seventh Century Monastery Church, Wienhausen. **8.0,** Concert by the Hamburg Philharmonic Orchestra, conducted by Maasz: Festival Overture on a Thuringian Theme (Lassen); Variations on the Folk Song, Alle Vögel sind schön da (Müller); Variations on the Volga Boat Song (Graener); Fantasia on Folk Songs (Blumer). **9.0,** News. **9.20,** Concert by the Small Station Orchestra, conducted by Secker: Hungarian Comedy Overture (Kéler Béla); Legend No. 8 (Dvorák); Fantastic Nocturne (Huppertz); Elegy (Secker); Old Chinese Suite (Niemann); Siciliana (Schmadstieh); Selection from Madame Butterfly (Puccini); Flirtation (Steck); Overture, Die Fledermaus (Joh. Strauss); Madrigalette (Bullerian); Waltz, Wiener Bürger (Zichrer); Cossack Song (Czernik); Cadet March (Sousa).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**10.30 a.m.** (from **Danzig**), Concert by the Danzig Theatre Orchestra. **12 Noon,** Time and Weather. **12.5 p.m.,** Gramophone Concert of Drinking Songs. In the intervals at **12.20** and **1.0,** News. **1.30,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Market Prices. **2.15,** Musical Programme for Children. **2.45,** See **Berlin (Funkstunde). 3.0,** See **Leipzig. 4.30,** Review of Books. **4.50,** Talk: Through little known Arabia. **5.15,** Market Prices. **5.25,** Talk: The Daily Life of a Commercial Traveller in East Prussia. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Symphony in D (Haydn) by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner. **7.35** (from **Danzig**), Poems by Ernst Frieböse. **7.50,** Johann Strauss Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner: Overture, Die Fledermaus; Tales from the Vienna Woods; Polka, Pizzicato; Overture, The Gipsy Baron; Waltz, Accelerationen; Gallop, Leichtes Blut; Radetzky-Marsch. **9.0,** News, followed by Political Press Review.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to **5.40 p.m.,** and 20 kW from **5.40 p.m.** Programme of the General Broadcasting Society (A.V.R.O.).—**10.10 a.m.,** Organ and 'Cello Recital by Frans Hasselaar and Andries de Swarte. **10.40,** Talk on Cookery. **11.40,** Time Signal. **11.41,** Concert by the Station Orchestra, conducted by Nico Treep: March, Blue Devils (Williams); Ballet Music from La Juive (Halévy); Moon Song (Daleroze); Air de ballet (Gillet); Accordion Music; Selection from The Pearl Fishers (Bizet); Accordion Music; Overture, Berliner Luft (Lincke); Wiener Spezialitäten (Hruby); Karo bube (Steele); Pumpernickel (Siede); Waltz, Wiener Bonbons (Joh. Strauss); Accordion Music; Selection from Die Bayadere (Kálmán); Pasodoble, Madrid (Speyer). **1.55,** Interval. **2.10,** Song and Pianoforte Recital by Annie Ragetli and Egbert Veen. **2.40,** Dressmaking Lesson. **3.40,** Pianoforte Recital by Hans Schouwman. **4.10,** Concert by a Children's Choir, conducted by Jacob Hamel. **4.40,** Programme for Children. **5.10,** Talk. **5.40,** Concert by Kovacs Lajos and his Orchestra. **7.10,** English Lesson. **7.40,** Time Signal. **7.41,** News. **7.45,** Concert of Opera Music by an Orchestra, Choir and Soloists. **9.40,** Acts 2 and 3 of Cesar and Cleopatra—Play in Five Acts (Shaw). **10.50,** News. **11.0,** Gramophone Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.**—**11.55 a.m.** till Close Down, Programme of the Catholic Radio Society (K.R.O.). **11.55,** Concert by the K.R.O. Boys, conducted by Lustenhonwer. **1.40,** Programme for Women. **2.40,** Dressmaking and Millinery Lesson. **3.40 to 3.55,** Interval. **3.55,** Gramophone Music. **4.25,** Song Recital by Vincent van den Berg (Tenor). **4.40,** Gramophone Music. **4.55,** Song Recital (contd.). **5.10,** Concert by the K.R.O. Sextet. **5.40,** Talk: The Students' International Missionary Congress. **5.55,** Sextet Concert (contd.: Schubert Potpourri (Urbach); Polish National Dances (Scharwenka); Finale. **6.20,** Esperanto Lesson. **6.40,** Police Notes. **6.55,** Literary Talk. **7.15,** Gramophone Music. **7.25,** Talk. **7.40,** Concert by the K.R.O. Orchestra, conducted by Gerritsen: Overture, Queen for a Day (Adam); Extracts from Zorahayda (Svendsen); Tambourin (Rameau). **8.0,** News. **8.5,** String Quartet, Op. 10 (Debussy). **8.35,** Gramophone Music. **8.40,** Plicht (Duty)—One-Act Play (Justus van Maurik). **9.5,** Quartet in A, Op. 18, No. 5 (Beethoven). **9.35,** Gramophone Music. **9.40,** Orchestral Concert: Overture, William Tell (Rossini); Danza piemontesi (Sinigaglia); Molly on the Shore (Grainger); Shepherd's Hey (Grainger); Seid umschlungen Millionen (Strauss); Persian March (Strauss). In the interval at **10.0,** De erfenis (Inheritance)—A Radio Play, and at **10.15,** News. **10.40,** Gramophone Music. **11.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results and News. **8.10,** Agricultural Notes. **8.20,** English Lesson. **8.35,** Radio Concert. **9.0,** News and Weather.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

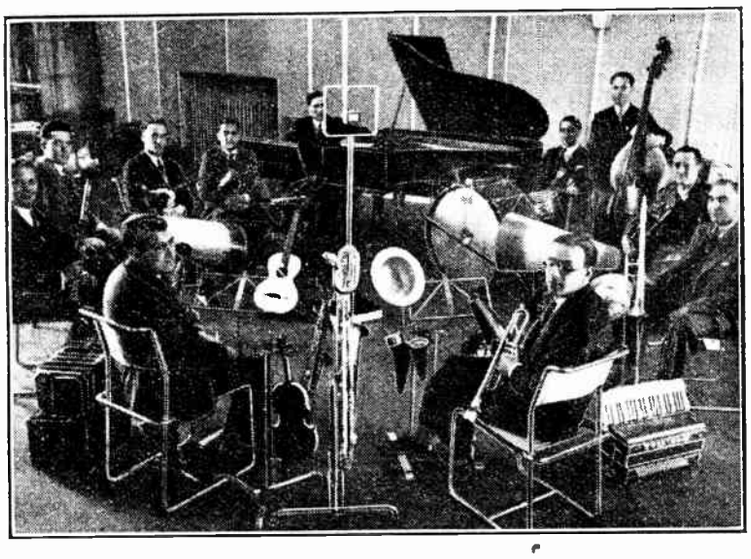
LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.15 p.m.,** See **Frankfurt. 12.25,** News and Weather. **12.35,** The Three Strausses—Gramophone Concert. **1.30,** Light Music by the Fröhlichen Funf. **2.10,** Reading (Theodor Storm). **2.30,** Market Prices. **2.50,** Political Address. **3.0,** See **Stuttgart. 5.0 to 5.35,** See **Frankfurt. 5.35,** Talk in Memory of Adolf Bartels. **5.50,** News. **6.0,** Transmission for all German Stations relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** See **Stuttgart. 9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News, Weather, and Sports Notes. **9.45,** See **Frankfurt. 11.14** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**12.30 p.m.,** Concert by the Station Orchestra, conducted by Hilmar Weber. Overture, Loreley, Op. 39 (Lachner); Selection from La cena delle beffe (Giordano); Waltz, Am Wörther See (Koschat); Selection from A Night in Venice (Joh. Strauss). **1.15 to 1.30,** News. **2.0,** Pianoforte Sonata Recital by Prof. Walter Petzet (Pianoforte): Biblische Sonate in C Minor (Kuhnau); Sonate pathétique in C Minor, Op. 13 (Beethoven). **2.35.** Exchange. **3.0,** Concert by the Leipzig Symphony Orchestra, conducted by Theodor Blumer. Soloists: Sigrid Walter Müller and Theodor Blumer (Pianoforte); Overture, Pique Dame (Suppé); Tarantella from Venezia e Napoli (Liszt); Pieces for two Pianofortes (Schütt): (a) Impromptu, Op. 58, No. 2, (b) Scherzino, Op. 79, No. 2; Ballet Suite from The Merry Wives of Windsor (Nicolai); Perpetuum mobile (Joh. Strauss); Waltz from the Second Serenade in B, Op. 63 (Volkmann); Polonaise from Eugène Onegin (Tchaikovsky); Pieces for Two Pianofortes: (a) Scherzando from Blanc et noir (Debussy), (b) Spanish Dance, Navarro (Sarasate); Overture, Wiener Frauen (Lehár); Concert Waltz, Op. 47 (Glazunov); Selection from Das süsse Mädel (Reinhardt). **4.30,** Review of Books. **5.0,** Talk: The Baltic Peoples. **5.25,** Topical Talk. **5.40,** Exchange and Review of the Day's News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Two Radio Pictures for Young People (Horst Lehmann and Fritz Schaadt). **8.0,** Concert by the Leipzig Viol Quartet. Quartet in A (Anon.); Duet in B Flat for two Violins (Haydn); Old Dances for Four Instruments; Sonata in D Minor for Four String Instruments (Rosenmüller); Andante and Rondo from the Sonata in C (Astorger); String Quartet in D (Joh. Chr. Bach). **9.0,** News. **9.30.** Talk on Ethnology. **10.0,** Concert by the Station Orchestra, conducted by Henri Pensis: Selection from Tiefland (d'Albert); Overture, Raymond (Thomas); Gnomenparade (Noack); Danse des petites poupées (Mertens); March, Folies-Bergères (Lincke). In the interval at **9.45,** News in German. **10.25,** Dance Music on Gramophone Records.



JAZZ FROM SWITZERLAND.—The dance orchestra at Sottens (Radio Suisse Romande) is always up to the minute with the latest "hits." Dance music is much more popular in French-speaking Switzerland than among the German section of the community.

NOV. 14th TUESDAY *continued*

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.15 p.m.,** See **Frankfurt. 12.25,** News and Weather. **12.35,** The Three Strausses—Gramophone Concert. **1.30,** Light Music by the Fröhlichen Funf. **2.10,** Reading (Theodor Storm). **2.30,** Market Prices. **2.50,** Political Address. **3.0,** See **Stuttgart. 5.0 to 5.35,** See **Frankfurt. 5.35,** Talk in Memory of Adolf Bartels. **5.50,** News. **6.0,** Transmission for all German Stations relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** See **Stuttgart. 9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News, Weather, and Sports Notes. **9.45,** See **Frankfurt. 11.14** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**12.30 p.m.,** Concert by the Station Orchestra, conducted by Hilmar Weber. Overture, Loreley, Op. 39 (Lachner); Selection from La cena delle beffe (Giordano); Waltz, Am Wörther See (Koschat); Selection from A Night in Venice (Joh. Strauss). **1.15 to 1.30,** News. **2.0,** Pianoforte Sonata Recital by Prof. Walter Petzet (Pianoforte): Biblische Sonate in C Minor (Kuhnau); Sonate pathétique in C Minor, Op. 13 (Beethoven). **2.35.** Exchange. **3.0,** Concert by the Leipzig Symphony Orchestra, conducted by Theodor Blumer. Soloists: Sigrid Walter Müller and Theodor Blumer (Pianoforte); Overture, Pique Dame (Suppé); Tarantella from Venezia e Napoli (Liszt); Pieces for two Pianofortes (Schütt): (a) Impromptu, Op. 58, No. 2, (b) Scherzino, Op. 79, No. 2; Ballet Suite from The Merry Wives of Windsor (Nicolai); Perpetuum mobile (Joh. Strauss); Waltz from the Second Serenade in B, Op. 63 (Volkmann); Polonaise from Eugène Onegin (Tchaikovsky); Pieces for Two Pianofortes: (a) Scherzando from Blanc et noir (Debussy), (b) Spanish Dance, Navarro (Sarasate); Overture, Wiener Frauen (Lehár); Concert Waltz, Op. 47 (Glazunov); Selection from Das süsse Mädel (Reinhardt). **4.30,** Review of Books. **5.0,** Talk: The Baltic Peoples. **5.25,** Topical Talk. **5.40,** Exchange and Review of the Day's News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Two Radio Pictures for Young People (Horst Lehmann and Fritz Schaadt). **8.0,** Concert by the Leipzig Viol Quartet. Quartet in A (Anon.); Duet in B Flat for two Violins (Haydn); Old Dances for Four Instruments; Sonata in D Minor for Four String Instruments (Rosenmüller); Andante and Rondo from the Sonata in C (Astorger); String Quartet in D (Joh. Chr. Bach). **9.0,** News. **9.30.** Talk on Ethnology. **10.0,** Concert by the Station Orchestra, conducted by Henri Pensis: Selection from Tiefland (d'Albert); Overture, Raymond (Thomas); Gnomenparade (Noack); Danse des petites poupées (Mertens); March, Folies-Bergères (Lincke). In the interval at **9.45,** News in German. **10.25,** Dance Music on Gramophone Records.

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**6.0 p.m.,** French Lesson. **6.30,** Talk on National Culture. **7.0,** Concert of National Dances. **7.30,** Songs. **8.0,** Recital of Duets. **8.30,** News and Weather. **8.45,** Dance Music. **9.30 to 10.0,** Programme in English by the I.B.C. International Broadcasting Club Concert: Blaze away; Roses from the South; Song, Berense de Jocelyn (Godard); Selection from White Horse Inn (Stolz-Benatzky); Wine, Woman and Song (Joh. Strauss); Song, I travel the road; An Old Violin (Fisher); You are my heart's delight from The Land of Smiles (Lehar). **10.0** (approx.), Close Down.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW. Belgian Evening.—**7.0 p.m.,** Gramophone Concert of Symphony Music. **7.40,** Concert by the Station Orchestra, conducted by Henri Pensis: Second Nocturne (d'Agrèves); Badinage (Jongen); Recitative and Aria (Brussel-mans); Barcarolle (de Sutter); Epithalame (de Sutter); Sérénade d'Arlequin (Van Dam). **8.20,** Concert by the Station Orchestra, conducted by Henri Pensis: Overture, Hamlet (Tchaikovsky); La Fontaine's Fables (Mouton); Brise de mer (Leoncavallo); Murmelndes Lüftchen (Jensen). **8.50,** News in French. **9.0,** Song Recital by Gustave Simon. **9.25,** Concert by the Station Orchestra, conducted by Henri Pensis: Selection from Tiefland (d'Albert); Overture, Raymond (Thomas); Gnomenparade (Noack); Danse des petites poupées (Mertens); March, Folies-Bergères (Lincke). In the interval at **9.45,** News in German. **10.25,** Dance Music on Gramophone Records.

LINZ.—See **Vienna.**

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Orpheus and Eurydice—Opera (Gluck), relayed from **Paris (Eiffel Tower).** After the Relay, News.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12 Midnight** till Close Down, I.B.C. Concert of Light Music: Hawaiian Waltz Medley (Traditional); Selection from The Land of Smiles (Lehár); Pa me es igual (Irusta); Marta (Simons); Speak Easy (Gensler); There's a Flower in my Ranch (Teisseier); That's my Home (Rene); Hawaiian Sunset (Vandersloot). **12.30 a.m. (Wednesday),** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Topical Talk and Request Gramophone Records. **7.30,** Talk by Joaquin España Cantos and Gramophone Records (contd.). **8.15,** Topical Review. **8.30 to 9.15.** Interval. **9.15,** English Lesson. **9.30,** Chimes, Time and Topical Review. **9.45** (approx.), A Musical Comedy. **11.45,** Topical Review. **12 Midnight,** Chimes. **1.0 a.m. (Wednesday)** till Close Down, I.B.C. Programme of Dance Music: The Grass is getting greener all the time; Remember my forgotten Man; Spanish Sweetheart; The Gold Digger's Song; Scotch Hot; If you'll say Yes, Cherie; Shadow Waltz; Drifting down the Shalimar; Let's call it a Day; Step Lightly; Happy as the Day is long; Waltz, Morella; Lady play your Mandoline; I raised my Hat; Roll up the Carpet; Twelfth Street Rag. **2.0,** I.B.C. Good-night Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**6.0 p.m.,** See **Prague. 6.10,** See **Brno. 9.0** till Close Down. See **Prague. 10.0** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.**—**10.45 a.m.,** Weather. **1.45 p.m.,** Weather. **2.0,** Concert of Russian Songs and Dances. **3.0,** English Lesson. **3.30,** Dramatic Programme of the Works of Mark Twain and Guy de Maupassant. **4.30,** Musical and Literary Programme for Young People. **5.30,** Chamber Music: Quartet in D (Borodin); Songs (Borodin); Sonata No. 2 (Chaporine); Piece (Shostakovitch). **8.0,** News. **8.30,** Programme Announcements. **8.55,** Chimes from the Red Square. **9.5,** Press Review. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**3.30 p.m.,** Orchestral Concert, conducted by Erich Kloss: Overture, The Siege of Corinth (Rossini); Elégie (Arensky); Selection from Oberst Chabert (Waltershausen); Waltz, Ball-Silhouetten (Jos. Strauss); Ballet Music from Lakmé (Delibes); Plantation Songs (McDowell); Catalonian Serenade (Niemann); Valencia (Micheli). **4.45,** Talk: The Egerland in the past and to-day. **5.5,** The Young Richard Strauss—a Musical Picture. **5.25,** Talk: The Execution of Katte by Frederick William the First. **5.45,** Time, Weather, and Agricultural Prices. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.15,** Orchestral Concert, conducted by Erich Kloss. **8.5,** Der g'scheide Bader One Act Comedy (Otto Willner). **8.30,** Quartet Concert, from **Leipzig. 9.0,** Time, Weather, News, and Sports Notes.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy (LCL), 6,990 kc/s, 42.92 metres.**—**4.0 p.m.,** Orchestral Concert, conducted by Nielsen, relayed from the Theatre Café. Soloist: Kramer Johansen (Saxophone). Persian March (Joh. Strauss); Popular Swedish Melodies and Dances (van Eysden); Waltz,

Sphinx (Popy); Pastorale (Larsen); Overture, Figaro (Mozart); Utsyn (Kramer-Johansen); Saxophone Solo: My Red Roses (Ruprecht); Selection from Madame Butterfly (Puccini); Norwegian Soldiers' March (Hilde). **5.0,** Talk for Housewives. **5.45,** Song Recital by Gigli, on Gramophone Records. **6.0,** Announcements, Weather, and News. **6.30,** English Lesson. **7.0,** Time Signal. **7.1,** Talk: Private Benevolent Institutions. **7.30,** Concert of Swedish Music, by the Station Orchestra, conducted by Kramm. Soloist: Henri Marteau (Violin). Overture, The Maid of Orleans (Södermann); Violin Concerto (Aulin); Suite for String Orchestra (Gunnar de Frumerie); Rhapsody (Atterberg). **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Concert of Old Folk Dances by Per Bolstad and his Ensemble, relayed from **Aalesund, 671 kc/s, 447.1 metres.** **9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Report, Agricultural Notes and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** La Bohème—Opera in Three Acts (Puccini), on Gramophone Records. In the intervals, Talk and Announcements. After the Opera, Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music. **7.5,** Sound Film Music. **7.15,** Le Journal Parlé. **7.30,** New Gramophone Music. **8.0,** Talk: The Music Hall. **8.5,** Talk: The Cinema. **8.15 to 8.35,** Interval. **8.35,** Concert by the Station Symphony Orchestra: Quartette concertante for Oboe, Clarinet, Horn, Bassoon and String Quartet (Mozart); Concerto for 'Cello and Orchestra (Saint-Saëns); Concerto for Pianoforte and Orchestra (Béché). **10.30,** News.

PARIS

RADIO PARIS. Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** News. **12 Noon,** Gramophone Concert: Moi, j'ne fiche rien (Borel-Clerc); Melody (Abraham); Jean de la lune (Ange); Prenez mes fleurettes (Bixio); Dans le chemin creux (Berthier); Blondes et brunes (Alberty-Mario); La forêt qui chante (Charlys); Parais à ta fenêtre (Gregh-Gueriany); On the Garden Wall (Sarony); La route est belle (Szulc); La ronde des heures (Sylviano); Dans larue (Yvain); Sous les ponts (Scotto); Sur les bords de la Seine (Scotto); Dans les jardins de Paris (Phylo and Fietter); Bonsoir Madame la lune (Marinier); La rue de la joie (Larrieu); Femmes que vous êtes jolies (Codini); Le vieux mendiant (Delmet); Un soir en passant (Mercier); Je pensais à vous (Borel-Clerc); Nuit grisante (Borel-Clerc); En regardant la lune (Cibolla); Montmartre (Alexander); Minuit, Place Pigalle (Ferreol); Sur la Place de l'Opera (Gpy-Rodor); Piece (Jessel); La Place blanche (Mele-Graven); Three o'clock in the morning (Robledo-Marchetti); Le petit rentier (Pierné); C'est près de sa femme qu'on est encore le mieux (Borel-Clerc); Joyeux retour (Avignon). In the intervals at **1.0,** Exchange and News, at **1.30,** Exchange, and **2.0,** Exchange and News. **3.45,** Exchange and Market Prices. **6.20,** Agricultural Talk. **6.45,** Extracts from Peer Gynt (Grieg), on Gramophone Records. **7.0,** Gramophone Music: Petite Suite de Concert (Coleridge-Taylor); Capriol Suite (Warlock); Saudades do Brazil (Milhand). **7.45,** Anglo-Saxon Press Review. **8.0,** Gramophone Music: Serenade of Love (Waldan); Black Eyes (Ferraris); My Rose (Fillis); Rondo (Andolf). **8.15,** News and Review by Pierre Seize. **8.30,** An Operetta in Two Acts (Benatzky), relayed from the Empire.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK on 48.86 metres and 25.27 metres.—7.0 p.m.,** Musical Originalities, from **New York. 7.30,** KDKA Home Forum. **8.0,** Rochester Orchestra, from **New York. 9.0,** Betty and Bob. **9.15,** Congress of Clubs. **9.30,** News and Markets. **9.45,** Talk, from **New York. 10.0,** Programme to be announced. **10.15,** KDKA Kiddies' Klub. **10.30,** Singing Lady, from **New York. 10.45,** Orphan Annie, from **New York. 11.0,** News and Pat Haley. **11.15,** Sports and Programme Preview. **11.30,** Evensong. **11.45,** Lowell Thomas, from **New York. 12 Midnight,** Amos 'n' Andy, from **New York. 12.15 a.m. (Wednesday),** Marvellous Melodies. **12.30,** Lois Miller, Organist. **12.45 to 2.30, New York** Relay. **12.45,** Carney's Dog Stories. **1.0,** Crime Clues. **1.30,** Adventures in Health. **1.45,** Trade and Mark. **2.0,** Musical Memories. **2.30,** Programme to be announced. **3.0,** Ortiz Tirado, from **New York.**

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Brno. 3.55,** Gramophone Records. **4.5,** See **Brno. 5.8,** Gramophone Records. **5.5,** Market Prices. **5.15,** Talk for Workers. **5.25,** News in German. **5.30,** Programme from Brno. **6.0,** Time and News. **6.10 to 9.0,** See **Brno. 9.0,** Time and News. **9.15,** Gramophone Records. **10.0** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres, 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.—6.0 to 6.15 a.m.** (from **Lausanne**). Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Geneva**), Opera Music on Gramophone Records. **12 Noon** (from **Geneva**), Financial Notes. **12.10 p.m.** (from **Geneva**), Gramophone Concert. **1.0,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0** (from **Lausanne**). Concert by the Small Radio Lausanne Orchestra, conducted by Moser. Part I, Chamber Music: Concerto for Pianoforte and String Orchestra (Lully, arr. Weingartner). Part II, Light Classical Music: Overture, Iphigenia in Aulis (Gluck); Invitation to the Waltz (Weber); Three Pieces (Borodin): (a) Intermezzo, (b) Serenade, (c) Mazurka; Selection from The Snow Maiden (Rimsky-Korsakov); Waltz and Slav Dance (Dvorák); Selection from The Dollar Princess (Fall). Part III, Folk Music. Part IV, Dance Music. **5.0** (from **Lausanne**), Programme for Women. **5.30** (from **Lausanne**), Literary Talk. **5.55** (from **Lausanne**), German Lesson. **6.20** (from **Lausanne**), Talk on the Reconstruction of the Grand-Pont. **6.50** (from **Lausanne**), Talk on the following Transmission. **7.0** (from **Lausanne**), Four One-Act Comedies. **9.0,** News and Weather. **9.15** (from **Lausanne**), Dance Music. **10.0** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres,** from **7.45 p.m.,** and **2RO, 11,810 kc/s, 25.4 metres.—12.5** (approx.). **to 1.15 p.m.,** Trio Concert from **Turin.** In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.55,** Giornale Radio and Exchange. **4.10,** Weather. **4.15 to 5.0,** Orchestral Concert: March, Vecchia guardia (Sinigaglia); Czardas (Giacchino); Lo sciocco stanco (Raffaelli); Waltz, Amaryllis (Escobar); Selection from Carmen (Bizet); Saper vorrei (Pavesio); Danza (Hamud); Grazie, signora (Montagnini). **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Morse Signals and Dopolavoro Report. **6.0,** Tourist Report. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time, Announcements, and Gramophone Records. **7.15,** Request Programme. **7.30,** Sports Notes. **7.45,** Concert by the Madami Mandoline Quartet. Soloist: Gianna Perea Labia (Soprano); Overture, Giannina e Bernardone (Cimarosa); Giga (Vivaldi); Soprano Solos: (a) Hallelujah (Mozart), (b) La pastorella (Rossini), (c) Aria from Lucia di Lammermoor (Donizetti); Nocturne from the Quartet in D (Borodin); Scherzo and Fandango (Lassen). **8.30** (approx.), Il cestello di fragole (The Basket of Strawberries)—A Play in One Act (Rosso di San Secondo). **9.0** (approx.), Variety Concert: Notti veneziane (Carnevali); Aria from Rigoletto (Verdi); Strange Harmony—Aria from Tosca (Puccini); Tu ca nun chiagne (de Curtis); Tenor Solo: L'ultima canzone (Tosti); Dance Music after the Programme. **10.0,** Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.—12.45 a.m. (Wednesday),** Stock Reports. **1.0 to 3.45,** New York Relay. **1.0,** Variety Programme. **1.30,** Wayne King's Orchestra. **2.0,** Ben Bernie's Blue Ribbon Orchestra. **2.30,** Variety Programme. **3.0,** Lives at Stake—Dramatic Sketch and Music. **3.30,** Madame Sylvia of Hollywood. **3.45,** Piano Pals, Pianists. **4.0,** Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **9.20** (from **Zürich**), Broadcast for Schools. **9.50 to 11.0,** Interval. **11.0** (from **Zürich**), Talk for Housewives. **11.5** (from **Zürich**), Light Orchestral Concert. **12.25 p.m.** (from **Zürich**), Time, Weather and Exchange. **12.30** (approx.) **to 2.30,** Interval. **2.30** (from **Zürich**), Concert by the Small Station Orchestra, conducted by Scherbaum. **2.59,** Time Signal from Neuchâtel Observatory. **3.0,** See **Radio-Suisse Romande. 5.0** (from **Berne**), Czech Folk Songs and Chamber Music on Gramophone Records. **5.30** (from **Berne**), Talk: A Berne Farmhouse. **6.0** (from **Berne**), Time, Weather and Notes on the Broadcast for Schools. **6.10** (from **Berne**), Talk: Sunday Excursions. **6.20** (from **Berne**), Light Music on Gramophone Records. **6.45,** Visit with the Microphone. **7.15** (from **Berne**), An Operetta (Offenbach). **8.0,** Weather and News. **8.10** (from **Berne**), Programme for the Seventieth Birthday of Selma Lagerlöv. **9.15** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 k.W. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.—1.45 to 2.10 p.m.,** Broadcast for Schools, relayed from **Malmö, 1,301 kc/s, 230.6 metres. 4.5,** Programme for Children, relayed from **Malmö. 4.30,** Song Recital by Karl Efraim Hellgren. **4.45,** Gramophone Music. **5.45,** French Lesson. **6.15,** Weather and News. **6.30,** Talk: The Gold Standard. **7.0,** Concert by a Male Voice Choir, conducted by Hildor Lundvik. **7.30,** The Practical Corner. **7.45,** Sonata No. 2 in E Minor for Violin and Pianoforte (Sjögren). **8.15,** Literary Review. **8.45,** Weather and News. **9.0** (approx.), Magic—Play (G. K. Chesterton), relayed from the Chamber Theatre. **9.45** (approx.). Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Gramophone Concert of Light Music. **12 Noon,** Orchestral Concert, conducted by Maurice de Villers. In the interval at **12.45,** News, and at **1.0,** Exchange. **2.0,** Interval. **4.45,** Talk on the French Colonies: The Political and Administrative Organisation of Cochin-China. **5.0,** Orchestral Concert, conducted by Roskam: March, Regimentskinder (Fucik); Waltz (Lincke); Overture, Vision d'autrefois (Arnaud-Marwys); Selection from Coppélia (Delibes); Violin Solo: Il bacio (Micheli); Rose—Thé (Fauchey); Selection from Ta bouche (Yvain). **6.0,** History Talk. **6.15,** Topical Talk. **6.30,** Orchestral Concert, conducted by Maurice de Villers: Overture, La fête au village voisin (Boieldieu); Waltz, Wiener Bonbons (Joh. Strauss); Two Pieces (Rubinstein): (a) Torch Dance of the Brides of Kashimir, (b) Toréador et Andalouse; Selection from Prosperine (Saint-Saëns); Orchestral Suite, Les Erynnies (Massenet); Russian March (Ganne). **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review, Lottery Results and Announcements. **8.30,** On ne badine par avec l'amour—Play (de Musset), with Incidental Music by Saint-Saëns, relayed from **Paris (Eiffel Tower), (1,445.7 metres;** 13 kW.). **10.30** (approx.), Press Review.

STUTTGART

MUHLACKER; 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.—12.25 p.m.,** Local News and Weather. **12.35,** See **Langenberg. 1.30,** Talk on Flowers. **2.0 to 2.20,** Programme for Children. **2.45,** See **Berlin (Funkstunde). 3.0,** Concert by the Station Orchestra, conducted by Otto Seyfert. Soloists: Annemarie Banzhaof (Soprano), Hans Hofele (Baritone), and Eduard Oswald (Violin). Overture to and March from Turandot (Weber); Pieces for Violin and Orchestra: (a) Air (Bach), (b) Gartenmelodie (Schumann), (c) Am Springbrunnen (Schumann); Two German Dances (Unger); Folk Duet for Soprano and Baritone; Witches' Ride (Humperdinck); Lento ma non troppo, from the Violin Concerto (Richard Strauss); Suite from Der Rosenkavalier (Richard Strauss); Folk Song Duets for Soprano and Baritone; Wedding Waltz (Dohnanyi); Gipsy Dance for Violin and Orchestra; Suite Mignonne for Two Flutes and Strings (Sibelius); Selection from Cavalleria rusticana (Mascagni). **5.0 to 5.35,** See **Frankfurt. 5.35,** Talk: Peasants, Mercenary Soldiers, and Heroes in the Thirty Years' War. **5.50,** Time and Agricultural Notes. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Operetta Music by the Station Orchestra, conducted by Gustav Görlich. Soloists: Hubert Buchta (Tenor), Hans Hanus (Tenor), Käte Mann (Soprano), and Hanne Schmitz (Soprano). In the interval, Sende zu Hause—Sketch (Carl Strube). **9.0,** See **Frankfurt. 9.20,** Things you should Know . . . **9.30,** News, Weather, and Sports Notes. **9.45 to 11.14,** See **Frankfurt. 11.14** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Orchestral Music. **6.30,** Chansonnettes. **6.45,** Military Music. **7.0,** Light Music. **7.15,** News, Horse Racing Results and Exchange. **7.30,** Divertissements sur des airs russes (Rabaud). **7.45,** Accordion Music. **8.0,** Hunting Music. **8.15,** Opera Music: Selection from Cavalleria rusticana (Mascagni); Selection from Madame Butterfly (Puccini); Prelude to the First Act of Carmen (Bizet); Overture, The Barber of Seville (Rossini). **8.30,** Opera Arias, from The Huguenots (Meyerbeer), Faust (Gounod), Rigoletto (Verdi), and Aida (Verdi). **8.45,** Music by a Viennese Orchestra. **9.0,** Music Hall. **9.30,** Orchestral Music: March of the Bedouins (Oscheit); The Flight of the Bumble Bee (Rimsky-Korsakov); Chinese Serenade (Siede); Marche joyeuse (Chabrier). **9.45** Opera Music: Arias from Carmen (Bizet), Werther (Massenet), Manon (Massenet), and Sophie Arnould (Pierné). **10.0,** Light Music. **10.15,** News. **10.30,** Programme for Listeners in Morocco: Selection from Le voyage en Chine (Gabriel Marie); Selection from La vie parisienne (Offenbach); Ballet Music, Les aventures du roi Pausole (Honegger); Chansonnettes. **11.0,** Music by an Argentine Orchestra. **11.15,** Dance Music. **12 Midnight,** News. **12.5 a.m. (Wednesday),** Music from Sound Films. **12.15,** Orchestral Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 913 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—4.10 p.m.,** Dance Music. **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Dopolavoro Notes, and Gramophone Music. **6.0,** Time, Report of the Royal Geographical Society, and Gramophone Music. **6.10,** Market Prices. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** News and Gramophone Music. **8.0,** Opera Relay. In the intervals, Talk and Art Notes. After the Opera, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in English. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres;; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. In an interval at **12 Noon,** Time and News. **1.0 p.m.,** Interval. **2.0,** Time and Announcements. **2.20,** Talk for Housewives. **2.30,** Recital of Children Songs by Lia Wagner-Schönkirch (Soprano). **2.55,** Italian Arias on Gramophone Records. **3.45,** Handwork for Children. **4.10,** Talk: Trips with a Collapsible Boat. **4.25,** Violin Recital by Lissy Siedek. Violin Sonata in D (Handel); Suite in Old Style (Reger). **5.5,** Talk: The Geographical Foundation of the Austrian States. **5.30,** Elementary French Lesson. **6.0,** Concert by the Wiener Symphoniker, conducted by Oswald Kabasta. Soloists: Enid Szantho (Contralto) and Anton Kamper (Violin). In an interval at **6.25,** Time and Announcements. **7.15.** Dramatic Recitations to the Pianoforte by Otto Tressler and Charles Cerné at the Pianoforte. **8.0,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. **9.15,** News. **9.30,** Talk: Snow-covered Austria. **9.45,** Dance Music on Gramophone Records, followed by Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5,** Chamber Music by the Adamska-Grossman Orchestra. In an interval at **11.30,** Radio Journal and Weather Report. **12 Noon,** Interval. **2.30 p.m.,** Economic Notes. **2.40,** Recital on Two Pianofortes by Lefeld and Rosenbaum; Suite, En blanc et noir (Debussy); Variations on a Theme of Haydn (Brahms); Variations in E Minor (Schubert). **3.25,** Savings Bank Correspondence. **3.40,** Talk on Sport. **3.55,** Baritone Solos, relayed from **Lwów, 788 kc/s, 381 metres. 4.20,** Violin Recital by Nina Manska: Romance (Sibelius); Andantino (Martini-Kreisler); Hymn to the Sun (Rimsky-Korsakov); Spanish Dance (Granados); La plus que lente (Debussy). **4.50,** Agricultural Notes. **5.0,** Talk: Architectural Treasures of Poland, relayed from **Poznan, 897 kc/s, 334.4 metres. 5.20,** Jazz Music on Gramophone Records. **6.5,** Miscellaneous Items. **6.25,** Reading. **6.40,** Programme Announcements. **6.45,** Radio Journal. **7.0,** Talk for the Fifteenth Anniversary of Polish Independence. **7.15,** Concert by the Symphony Orchestra, conducted by Oziminski. Soloist: Perkowies (Tenor). In the interval at **8.15,** Reading. **9.15,** Sports Notes. **9.25,** Dance Music by the Melodyst Orchestra, relayed from the Oaza. In the interval at **10.0,** Aviation Weather Report and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

NOV. 14th TUESDAY *continued*

WEDNESDAY
NOVEMBER THE FIFTEENTH

ALGIERS

415.5 kc/s, 363.3 metres; 13 kW. **7.10 p.m.,** Shipping Notes. **7.15,** Agricultural Report and Weather Forecast. **7.20,** Song Recital by Ninon Vallin (on Gramophone Records). **7.55,** News. **8.0,** Time and Lottery Results. **8.10,** Wagner Concert, conducted by Henry Defosse: Bacchanale from Tannhäuser; Forest Murmurs from Siegfried; Prelude to Act I of Lohengrin; Prelude to Act III of Lohengrin; Prelude and the Death of Isolda from Tristan and Isolda; Good Friday Magic from Parsifal; Overture and Symphonic Extracts from The Mastersingers. In the interval at **8.45,** News and Gramophone Records. **9.40,** News. **9.45,** Act I, Scene I of Le Chandelier (de Musset). **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gaelic Talk. **7.15,** German Lesson. **7.30,** Time Signal. **7.31,** Lecture Recital by John Brennan. **8.0,** Harp Solos by Annie Fagan. **8.15,** Variety Programme by John MacDonagh and Company. **9.15,** Bass-Baritone Solos by J. C. Browner. **9.30 to 10.30,** Programme by the I.B.C. (Ireland) Ltd. **9.30,** Dance Music: Signature Tune: Don't be late in the Morning; Remember my forgotten Man; You're the Cream in my Coffee; I cover the Waterfront; Hiawatha's Lullaby; Signature Tune: Don't be late in the Morning. **9.45,** Dance Music: Wherever you are; Gypsy Fiddles; Looking Forward; Trouble in Paradise. **10.0,** Concert by the International Broadcasting Company (Ireland) Ltd.: Selection from Lilac Time (Schubert-Berté); Kessako (Chapuis); Bells across the Meadows (Ketelbey); Pianoforte Solo: Keyboard Kapers (Steele); Love in Cloverland (Peter); Smilin' through (Penn). **10.30,** I.B.C. Good-night Melody, followed by News and Weather. **10.40,** Cathal O'Byrne, Entertainer. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW. **6.0 p.m.,** Trio Concert: Selection from Tosca (Puccini); Extracts from The Rhinegold (Wagner); Canzonetta No. 3 (d'Arbrosio); Air de ballet (de Taeye); Melody (Ackermans); Minuet from Le Bourgeois gentilhomme (Lully); Selection from Boris Godunov (Mussorgsky). **7.0,** Request Gramophone Records. **7.30,** Exchange and Gramophone Records (contd.). **8.0,** Gramophone Music and News. **8.30,** Educational Programme: Geography and History Lesson. **9.0,** Chimes from the Cathedral, Weather Exchange, and Market Prices. **9.5,** Concert by the Station Orchestra. **9.20,** Programme by the Demon Jazz Orchestra. **10.0,** Vocal Quartet Concert. **10.30,** Chamber Music. **11.0,** News, followed by Dance Music from the Casa Libre. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW. **3.30 p.m.,** Programme for Children. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15,** See **Turin. 7.30** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**5.55 p.m.,** Time and Announcements. **6.0,** Concert by the Station Orchestra. **7.0,** Programme from **Ljubljana, 522 kc/s, 574.7 metres. 9.0,** Time and News. **9.15** (approx.), Dance Music on Gramophone Records. **9.45,** Cigány Music, relayed from the Potrosacka Zadruga Restaurant.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**11.0 a.m.,** Gramophone Concert: Melody (Tchaikovsky); Siciliana (Schmalstich); Schmetterlingsreigen (Schmalstich); Song, Nacht und Träume (Schubert); Dilirich - Walzer (Strauss); Waltz, Sphärenklänge (Jos. Strauss); The Canary (Poliakin); Taufrische Maisblätter (Nador); Dance of the Nymphs; Clog Dance; Die türkische Scharwache (Michaelis); Launisches Glück (Strauss); Hungarian Serenade (Lavotte). After the Concert, Weather. **11.55,** Time Signal. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Folk Music on Gramophone Records. **2.0,** Programme for Children. **2.30,** Weather and Exchange. **2.45,** Reading (Christian Reuter). **3.0,** See **Hamburg. 4.0,** Programme for Girls. **4.20,** Concert of Chamber Music: Sonata for Violin and Pianoforte (Hösl); Pianoforte Solos (Chopin): (a) Prelude in C minor, (b) Nocturne in C minor, (c) Waltz in A flat, (d) Etude in A flat, (e) Scherzo in B flat minor. **5.0,** Poems. **5.5,** Religious Programme with Organ Music. **5.30,** Tokio-Berlin Exchange Programme: Talk by the German Ambassador in Tokio and the Japanese Ambassador in Berlin. **5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** To-day's Motto. **7.5,** The Magic of the South Seas—Talk with Gramophone Illustrations. **8.0,** Dance Music by Robert Gaden and his Band. **9.0,** News. **9.45,** Weather. **10.0,** Radio Report of the Six Days' Racing, relayed from the Sportpalast. **10.10,** Dance Music (contd.). **11.30** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—3.30 p.m.,** Weber Concert on Gramophone Records: Overture, Abu Hassan; Invitation to the Dance; Drei Sterne; Overture to and Concert Version of Der Freischütz. **4.30,** A Self Portrait—Talk by Hans Gathmann, with Gramophone Illustrations. **4.50,** Wagner and Richard Strauss Song Recital by Olga Blomé (Soprano): Two Songs (Wagner): (a) Träume, (b) Im Treibhaus; Two Songs (Strauss): (a) Traum durch die Dämmerung, (b) Morgen. **5.5,** See **Berlin (Deutschlandsender). 5.30,** The Funkstunde Informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations: Anton Bruckner and Hugo Wolf Concert by the Station Choir, conducted by Heinzkarl Weigel and the Steiner Quartet. Soloists: Gertrud Baumann (Soprano), Anna Bellé (Soprano), Paul Lohmann (Bass), Emil Prietze (Viola), Waldemar von Vultée (Pianoforte) and Alexander Ecklebe (Organ). Part I, Bruckner Music: Choir, Three Trombones and Organ: Ecce sacerdos magnus; Soprano Solo with Pianoforte Accompaniment: Amaranths Waldeslieder; String Quartet and Viola: Intermezzo; Male Voice Choir, Two Sopranos and Pianoforte: Herbstlied. Part II, Hugo Wolf Music: String Quartet: Italian Serenade; Five Bass Solos: (a) Denk es, o Seele, (b) Auf ein altes Bild, (c) Und willst du deinen Liebsten sterben sehen, (d) Zur Warnung, (e) Epiphanias; Choir: Four Sacred Songs after Poems by Eichendorf: (a) Vergeht mir der Himmel vor Staube schier, (b) Komm, Trost der Welt, du stille Nacht, (c) Dein Wille, Herr, geschehe, (d) So lass herein nun brechen die Brandung wie sie will. **7.5,** Concert on Electrical Instruments with Introductory Talk and Commentary. **7.45,** Beethoven Concert by the Station Orchestra, conducted by Otto Frickhoeffer, Soloist: Elly Ney (Pianoforte). Pianoforte Concerto No. 5 in E flat, Op. 73; Symphony No. 5 in C minor, Op. 67. **9.0,** News. **9.15** (approx.), Light Music and Dance Music on Gramophone Records. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.3 metres; 14 kW.—**4.55 p.m.,** Hungarian Transmission; Concert by the Station Quartet; Soloist, Marta Lanyiova (Songs): Songs; Il Tramonto—Lyric Poem for Mezzo-Soprano and String Quartet (Respighi); Fantasia for String Quartet (Frank Bridge). **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.25,** Sonata for 'Cello and Pianoforte, Op. 104 (Godard). **6.55 to 9.15,** See **Prague. 9.15** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 235.1 metres.—12.45 p.m.,** Time and Weather. **1.10** (from **Gleiwitz**), Gramophone Concert: Wilhelm Kempff: Bagatelle in C, Op. 33 (Beethoven); Egon Petri: (a) Waltz in A flat (Chopin), (b) Paganini Etude in E (Liszt); Wilhelm Backhaus: Hungarian Rhapsody No. 2 (Liszt); Alfred Cortot: Rigoletto Concert Paraphrase (Verdi-Liszt). **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.20** (from **Gleiwitz**), Talk: Conflicting Loyalties in the Frontier Districts. **2.40,** Reading (Margarete Nitsche). **3.0** (from **Gleiwitz**), Concert of Light Music by the Michael Dammann Orchestra, relayed from the Haus Oberschlesien. In an interval at **4.0,** Theatre Review. **4.50,** Talk: The Construction of the Klodnitz Canal. **5.10,** Radio Report from the Rosenberg Sheet Metal Foundries. **5.40,** Programme Announcements and Market Prices. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** News. **7.10,** Lulu von Strauss und Torney—Radio Sequence from her Works (Elisabeth Darge). **8.0,** Concert of Classical Music by the Station Orchestra, conducted by Hermann Matzke. **9.0,** Time and News. **9.30,** Dance Music and Light Music by the Station Orchestra, conducted by Topitz: Soloist: Hellmutt Hallendorf (Tenor). **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission. News and Talk on Peace. **6.0,** See **Prague. 6.25,** Reading: English Literature. **6.40,** Recital of Rimsky-Korsakov and Tchaikovsky Songs. **6.55,** See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW. **12 Noon,** Concert by the Max Alexys Orchestra. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Radio Orchestra. **5.0,** Concert by the Symphony Orchestra, conducted by Kumps. **6.0,** Talk: Modern Tendencies in Painting. **6.15,** Concert of Mediæval Music by the Pro Musiqua antiqua Society: Conductor, Safford Cape: Introductory Talk by Charles Van den Borren: Je puis trop bien ma dame comparer; Ballad for Mezzo-Soprano with Flûte à bec, Harp and Alto Vielle Accompaniment (de Machaut); Tenor Solo with Vielle Accompaniment: Puisqu'en oubli suis de vous douce amie (Machaut); Contralto Solo with Harp and Tenor Vielle Accompaniment: Très douce que j'adur (Machaut); Fifteenth Century Songs with Flûte à bec, Tenor Vielle, and Harp Accompaniment (Dufay): (a) Duet for Mezzo-Soprano and Contralto, La belle se sied au pied de la tour, (b) Contralto Solo, Malheureux Cuer, (c) Trio for Soprano; Contralto and Mezzo-Soprano: J'atendray tant qu'il vous playra; Three Fifteenth Century Chansons: (a) Rondo for Vielles, Flute à bec, and Harp: Pour l'amour de ma doulce amye (Dufay), (b) Rondo for Tenor and Alto Vielle: Vostre allée me desplait tant, Gilles binchois (Dufay), (c) Rondo for Flute à bec, Harp and Alto Vielle: Ce moys de may soyons lies (Dufay); Sacred Music of the Fifteenth Century: (a) Duet for Soprano and Tenor, with Flute à bec, Tenor Vielle and Trombone Accompaniment: In tua memoria, Virgo Mater (de Lautins), (b) Tenor Solo with Vielle Accompaniment: O flos flagrans (Dufay), (c) Mezzo-Soprano and Tenor, with Flute à bec, Alto Vielle, Trombone and Tenor Vielle Accompaniment: Kyrie from the Mass, Se la face ay pale (Dufay). **7.15,** Protestant Address. **7.30,** Talk on Hygiene. **8.0,** Overture, Iphigenia in Aulis (Gluck), on Gramophone Records. **8.5,** Andromaque—Tragedy in Five Acts (Racine). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW.—**12 Noon,** Concert by the Radio Orchestra, conducted by Franz André: Bugle Call Blues (Mac Knight); There's a Rainbow round my Shoulder (Jolson); Burlesco (Stekke); Achtung, achtung (Dostal); Marimba Solo; Funny Notes (Nichols); Polka (Prazsky); Egyptian March (Joh. Strauss); Perpetuum mobile (Joh. Strauss). In the interval at **12.5 p.m.,** Aviation Report. **1.0,** Le Journal Parlé. **1.10,** Concert by the Max Alexys Orchestra. **5.0,** Concert of Light Music by the Radio Orchestra, conducted by Franz André. **6.0,** Gramophone Music. **6.15,** Talk: The Dutch East Indies and the Congo. **6.30,** Concerto in A Minor for Pianoforte (Schumann) on Gramophone Records. **6.50,** Protestant Address. **7.5,** Concert of Music on Electrical Instruments. **7.30,** Horticultural Report. **8.0,** Concert by the Station Symphony Orchestra, conducted by Kumps: Soloist, Loenfier (Tenor): Overture, Si j'était roi (Adam): Humoresque (De Taeye); Valse d'amour (Lemoine); Marche lorraine (Ganne); Selection from Madame Butterfly (Puccini); Three Dances (Grossmann). **8.45,** Recitations. **9.0,** Concert (contd.): Suite alsacienne (Massenet); Tenor Solos: Potpourri of Alsatian Dances (Rasse); Tenor Solos: Le mai d'amour (Gaillard). **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert by the Station Orchestra. March (Weissblüth); Poème oriental (Werba); Piece (Leuschner); Valse d'amour (Moszkowsky); In a Chinese Temple Garden (Ketelbey); Selection from Cavalleria rusticana (Mascagni). Selection from The Flower of Hawaii (Abraham); Suite on Strauss Themes (Morena); Barcarolle (Grünfeld); Oriental Piece (Siede); Valse intermezzo (Postupa). In an interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Quartet in A for Pianoforte (Chausson). **7.30,** Talk. **7.45,** Song Recital. Liebesbrief (Korngold); Nicht mehr zu dir zu gehen (Brahms); Two Songs (Ghidionesco); Four Songs (R. Strauss): (a), Traum durch die Dämmerung, (b) Geduld, (c) Schlechtes Wetter, (d) Zueignung. **8.5,** Harp Solos. **8.35,** Radio Journal. **8.50,** Romanian Music by the Station Orchestra.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **6.30 p.m.** till Close Down. **4.0 p.m.,** Gramophone Music. **5.0,** Reading. **5.30,** Concert by the Hungarian String Trio: Trio in G, Op. 9, No. 1 (Beethoven); Serenade (Weiner). **6.30,** Radio Play. **7.15,** News. **7.30,** Concert by the Liszt Society, relayed from the Academy of Music. **9.15,** Weather. **9.20** (approx.), Concert by the Pali Portis Cigány Band, relayed from the Hotel Britannia.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamleback, OXY, 31.51 metres.—11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.15,** Broadcast for Schools. **11.45,** Concert by the Arnold Nielson String Ensemble, relayed from the Ritz Restaurant. **1.0 p.m.,** Interval. **2.0,** Gramophone Concert of Popular Music. **2.30,** Concert by Louis Preil's Instrumental Ensemble: Military March (Smith); Entr'acte (Schmidt-Hagen): Selection from Spelmanslätar (Liss-Emil): In Wien wo der Wein und der Walzer blüht (Stolz); The Two Guitars (Makarow); Intermezzo, Die Rolltreppe (Kötscher and Winkler); The Marionettes March (Savino and de Rose); Valse impromptu (Oldenborg-Poulsen); Manhattan Serenade (Alter); Paraphrase, La Paloma (Weninger); Vor einer alten Spieluhr (Mueller-Melborn); Czardas (Nicklass-Kempner); Serenade (Hans Löhr); Jazz Rhapsody on a Theme by Franck (Rosenberg). In the interval at **3.15** (approx.), Talk for Women. **4.30,** Exchange and Fish Market Prices. **4.45,** Political Talk. **5.15,** French Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Agricultural Talk. **7.0,** Time Signal from the Town Hall. **7.1,** Operetta Music by the Radio Orchestra, conducted by Emil Reesen: March from Senova (Hirsch); Selection from Oh Kay (Gershwin); Foxtrot from The Cousin from Nowhere (Künnecke); Selection from Katinka (Friml); Waltz from Die himmelblaue Zeit (O. Strauss); Two Pieces (Lehár): (a) Tango from The Czarevitch: Overture, Gipsy Love. **7.45,** Sonata in G for Flute and Harpsichord (Sarti). **8.5,** Talk and Reading from Holberg's Epistles. **8.45,** Saxophone Recital by Rascher. **9.5,** News. **9.20,** Extracts from Peer Gynt (Grieg), by the Radio Orchestra, conducted by Emil Reesen. **10.0,** Dance Music by the Erik Tuxen Band, relayed from the Palace Hotel. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW. **6.5 p.m.,** Talk: Old Cracow. **6.20,** Miscellaneous Items. **6.25,** See **Warsaw. 9.15,** Sports Notes. **9.25,** Light Orchestral Music, relayed from the Pavilion Restaurant. **10.30** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW. **11.0 a.m. till 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I: Request Programme: Signature Tune; The Village Band (Fryburg); River stay 'way from my Door (Woods); Wid de Moon, Moon, Moon (Cook); Love is the Sweetest Thing (Noble); Danny Boy (arr. Weatherley); Selection of Leslie Stuart's Songs; Leanin' (Williams); My Wishing Song (Burke). Part II: Request Programme of Old Dance Favourites; Dancing with the Daffodils; I love the Rain; Susie; Happy little Tune; For you; Love me to-night; The Sheik of Araby; Smile, darn ya, smile; Signature Tune. **12 Noon,** Programme in French. **4.30 to 6.0 p.m.,** Programme in English by the I.B.C. **4.30,** The I.B.C. Nursery Corner. **4.40,** Isle of Wight Concert: Signature Tune: The Night by the Sea; The Clatter of the Clogs (Flynn); Chinatown, my Chinatown (Schwartz); No, No, Nanette (Youmans); Pianoforte Solo: Butterflies in the Rain (Myers); In the Night (Tate); My Dream (Waldteufel); Bandonion Solo: Father Rhine March (Porschmann); Waltz, Amourcuse (Berger); Violin Solo: Indian Love Call (Friml); Once on the Rhine (Ostermann). **5.20,** Portsmouth and Southsea Concert: Pianoforte Solo: Magic Notes (Steininger); Xylophone Solo: Spanish Dance (Moszkovsky); Songs: (a) Come along with me, (b) Coming round the Mountain (Hill Billy); Violin Solo: Souvenir (Drdla); Pianoforte Duet: Who do you think you are? (Heymann); Why waste your Tears? (Holstein); Xylophone Solo: Fiddlesticks (Robbins); When you and I were young, Maggie; Where are you? (McVey); Banjo Solo: Heather Bloom (Kirby); Jack o' Clubs (Steele); Signature Tune. **6.0,** Programme in French. **10.0** (approx.) till Close Down. Programme in English by the I.B.C. **10.0,** Dance Music: Signature Tune: Bells of Normandy; Sundown in a little Green Hollow; Moths around the Candle Flame; Solitario; Dinner at Eight;

Isn't It Heavenly; Lazybones; Egypt; Cecilia Mia; If you'll say Yes, Cherie; Vilia; Look what you've done; Sing another Line; I'll show you off; Let's call it a Day; Oh, Johanna; Mademoiselle; Signature Tune. **11.0,** Talkie Time. Tunes from the Talkies and Shows. Signature Tune: Sittin' in the Dark; Selection from Wild Violets (Stolz); Falling in Love again (Hollander); Everyone says I Love You (Kalmar); Making a Talkie (Clapham and Dwyer); One little Drink (Akst); To-day I feel so Happy (Carter); Selection from Music in the Air; I always keep my Girl out late (Abraham); Signature Tune. **11.30,** Concert of Sterno Records: The Doge's March from The Merchant of Venice Suite (Rosse); Valse des fleurs (Tchaikovsky); Honolulu Bay (Kahn); Kisses in the dark; The Roaming Yodeller (Norton); Harlequin's Serenade from I Pagliacci (Leoncavallo); Second Serenade (Heykens); La Paloma (Yradier). **12.5 a.m. (Thursday),** News Bulletin in English. **12.10** (approx.), Club Concert for Littleport Listeners: Signature Tune: The Chum Song; I've found the right Girl (Lupino); I bring a Song (Young); What a Perfect Combination (Kalmar); Happy as the Day is long (Koehler); Ding, Dong Ding (Hargreaves); Lover's Lane (Miller); A Girl like Nina (Hammerstein); At the Old Pig and Whistle (Butler); Lover (Rodgers); Let's make up (Little); Whistling under the Moon (Hargreaves); Louisiana Lullaby (Newman); Don't blame me (Fields). **1.0,** Dance Music: Signature Tune: Bells of Normandy; My Moonlight Madonna (Fibich); With you here and me here (Eyton); Nunca Tango (Pesenti); The Wedding of Mr. Mickey Mouse (Pola); Shadows on the Swanee (Young); Goodnight little Girl of my Dreams (Tobias); It was a night in Junne (Revel); From me to you (King); My Wishing Song (Burke); Experiment (Porter); Isn't this a Night for Love (Burton); Bugle Call Rag (Schobel); The Shadow Waltz (Warren); My Lucky Day (Parr-Davies); Adios, Goodbye (Franlau); Trouble in Paradise (Wever); Signature Tune. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.25,** News and Weather. **12.35 to 2.30,** See **Stuttgart. 2.30,** Weather. **2.40,** Time and Economic Notes. **3.0,** See **Stuttgart. 5.0,** See **Langenberg. 5.20,** Programme to be announced. **5.30,** See **Berlin (Deutschlandsender). 5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** Topical Talk. **7.10 to 9.0,** See **Langenberg. 9.0,** Time and News. **9.20,** Time and News. **9.30,** News. **9.45 till Close Down,** See **Stuttgart. 12 Midnight** (approx.). Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0,** Concert by the Small Station Orchestra, conducted by Gerhard Maas, relayed from the Radio Exhibition. Overture, Prince Igor (Borodin); Russian Suite (Bullerian); Small Suite for Two Flutes and Orchestra (Sibelius); Dances of the Nations (Mannfred). **4.0,** Emil Sandt reads from his Book, Gorch Fock and ich. **4.30,** Variety Programme. **5.40,** Frankfurt Exchange and Hamburg Market Prices. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.5,** See **Berlin (Funkstunde). 9.0,** Time and News. **9.20,** Concert of Light Music by the Tibor v. Ragotzky Orchestra, relayed from the Atlantic Hotel. **10.0** (from **Bremen**), Concert of Dances by the Bremen Municipal Orchestra, conducted by Reinhold Krug. Furientanz and Reigen seliger Geister (Gluck); Temple Dance (Grieg); Minuet (Beethoven); Scheherazade (Schmalstich); To an Egyptian Dancer (Gravina); Marquisette (Lindsay-Theimer); Ballet Overture (Lincke); Dance of the Dervishes (Bendix); Faun und Nymph (Königsberger); Marionetten-Groteske (Dreyer); Indian War Dance (Lumbye); Schäfertanz (Wetzler).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert of Opera Music. In the intervals at **12.20** and **1.0,** News. **1.30,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.20,** Hints for Housewives. **2.30,**

NOV. 15th WEDNESDAY *continued*

Programme for Children. **3.0,** Concert by the Small Station Orchestra, conducted by Gerhard Maasz: Overture, Prince Igor (Borodin); Russian Suite (Bullerin); Small Suite for Two Flutes and Orchestra (Sibelius); Dances of the Nations (Mannfred). **4.30,** Book Review. **4.50,** Walter Graeber Song Recital by Helen Thiel (Soprano); Havellied; Abendliedchen; Lied aus der Spinnstube; Lass meine Weg' mich wandern; Fromm; Zu spät; Das Herzensschlüsselein. **5.15,** Agricultural Prices. **5.25,** Programme for Parents. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** News. **7.5,** See **Berlin (Deutschlandsender). 7.25,** Dance Music by the Small Station Orchestra, conducted by Eugen Wilcken, and a Dance Band conducted by Erich Börschel. In an terval at **9.0,** News. **10.0,** Gramophone Concert. **11.0** (approx.). Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.—11.40 a.m.** till Close Down. Programme of the Workers' Radio Society (V.A.R.A.). **11.40,** Organ Recital by Steyn. In the interval. Gramophone Records. **12.40 p.m.,** Address. **12.45,** Gramophone Records. **1.40,** Interval. **1.55,** Dressmaking Lesson. **2.40,** Programme for Children. **5.10,** Orchestral Concert. **6.10,** R.V.U. Programme. **6.40,** Topical Talk. **7.0,** Orchestral Concert, conducted by de Groot; Soloist: Feltkamp (Flute): Overture (Smyth); Jeux en plain air (Tailleferre); Flute Concerto (Bosmans). **7.40,** News and S.O.S. Announcements. **7.55,** The Mother—Radio Play (Bertholt Brecht), with Music by Eisler. **8.40,** Results of the German Elections. **8.55,** Orchestral Concert, conducted by de Groot: Overture, La dame blanche (Boieldieu); Selection from Countess Maritza (Kálmán); Selection from Die geschiedene Frau (Fall); Das Blumenmädel (Siede); Backfischenparade (Lincke); Selection from The Girl in the Taxi (Gilbert); March (Lehár). **9.40,** The Call from the Ether—Radio Play (Minck). **10.25,** Organ Solos by J. Jong: Selection from Cavalcade (Coward). **10.40,** Talk for parents. **11.0,** Gramophone Records. **11.40** (approx.). Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW from **3.40 p.m.** Programme of the Christian Radio Society (N.C.R.V.).—**11.40 a.m.,** Police Notes. **11.55,** Gramophone Music. **12.10 p.m.,** Concert by the van der Horst Ensemble: Selection from Joshua (Handel); Songs (Woensel Kooy); Sonata (Steffani); Gramophone Records; Die ehre Gottes aus der Natur (Beethoven); Prayer (Pomper); Song from Laudamus (Woensel Kooy); Mozart Potpourri (Urbach). **1.40,** Gramophone Records. **2.10,** Hints for Housewives. **2.40,** Reading. **3.10,** Concert by the Sursum Corda Women's Choir. In the interval. Gramophone Music. **4.40,** Programme for Children. **5.40,** Agricultural Talk. **6.10,** Programme to be announced. **6.40,** Police Notes. **6.55,** Religious News. **7.10,** Recitations. **7.40,** Programme relayed from the Lutheran Church at Daventer. Addresses, Songs and Organ Solos. **9.10,** Violin and Organ Recital by Hermann and Kloek: Allegro maestoso, Op. 28 (Elgar); Hymn (Kint); Prelude and Allegro (Pugnani-Kreisler); Meditation in E (Dubois); Offertoire in C (Boellmann); Cavatina (Raff); Romance (Svendsen); Pastoral Rhapsody, Op. 48, No. 3 (Salomé); Traumerei (Schumann). **9.40** (in an interval), News. **10.10,** Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results, and News. **8.10,** Press Review. **8.20,** Radio Concert. In the interval at **9.0,** News and Weather.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**11 a.m.,** Concert by the Fröhliche Fünf, with Saxophone and Accordion Music: Selection from Gipsy Love (Lehár); Torna a Sorriento (Curtis); Melody, An der Weser (Pressel); Javatläume (Eysoldt); Blumengeflüster (Blon); Song Potpourri, Servus Wien (Dostal); Dance Fantasia (Robrecht); Foxtrot Intermezzo, Fensterpromenade (Robrecht). **12.15 p.m.,** See **Frankfurt. 12.25,** News. **12.35 to 2.30,** See **Stuttgart. 2.30,** Economic Notes. **2.50,** Political Announcements. **3.0,** See **Stuttgart. 5.0,** German for Germans. **5.20,** News. **5.30,** See **Berlin (Deutschlandsender). 5.55,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** See **Frankfurt. 7.10,** Concert by Maragarete Katzfey (Soprano), Heinz Schlebusch (Tenor) and the Station Orchestra, conducted by Kniep. **8.10,** The German Ballad in Literature and Music—Lecture Recital. **9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News. **9.40** till Close Down. See **Stuttgart. 12 Midnight** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—11.5 a.m.,** Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber: Champagne Overture (Baussern); Suite No. 1 from L'Arlésienne (Bizet); Marche héroique, Op. 40, No. 2 (Schubert); Hungarian Rhapsody No. 1 in E flat (Liszt); Valse-Ariette from Romeo and Juliet (Gounod); Waltz from Faust (Gounod); Suite in Dance Form (Kienzl); Selection from Aida (Verdi); Czardas from Ritter Pasman (Joh. Strauss); Waltz from Der Opernball (Heuberger). In the interval at **12.15 p.m.,** News. **1.0,** News. **1.15,** Interval. **1.35,** Talk: Danzig, an Old Hanseatic Town. **2.0,** Lortzing Music on Gramophone Records. **2.35,** Market Prices. **3.0,** Concert from **Stuttgart. 4.0,** Talk: A Journey to the East. **4.30,** Review of Publications. **4.50,** Concert of Folk Songs by the Mittle Middle German Vocal Quartet: Ich soll und muss einen Buhlen haben; Preis der Liebsten (Hassler); Werbung; Jelängerjelieber (Schein); Frühlingsreigen (arr. Mandyczewski); Nach Ostland wollen wir reiten (arr. Reger); Silesian Folk Song, Die glückliche Nonne (arr. Fuchs); East Prussian Folk Song, Der wilde Jäger und die Waldminne (arr. Hegar); Silesian Folk Song, Ziege und Beck (arr. Reger); Silesian Folk Song, Käferhochzeit (arr. Othegraven). **5.15,** Talk: The Original Home of the German People. **5.40,** Economic Notes, News, and Review of the Day. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** Talk: Do you know your own Country? **8.30,** Thuringian Evening. **9.0,** Dance Music. **10.0,** Programme to be announced. **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**6.0 p.m.,** Topical Talk. **6.30,** Literary Talk. **7.0,** Choral Concert. **7.45,** Pianoforte Recital. **8.30,** Concert by the Station Orchestra. **9.0,** Time, News and Dance Music.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW. Luxembourg Evening.—**7.0 p.m.,** Song Recital by Dolorès Goeres: Arias from (a) Don Giovanni (Mozart), (b) The Creation (Haydn); Elsa's Dream, from Lohengrin (Wagner); Aria from Carmen (Bizet); Song, La bergère aux champs (arr. Tiersot). **7.30,** Gramophone Concert of Variety Music. **8.0,** Recital of Luxembourg Songs by Jules Michel (Bass). **8.35,** News in French. **8.45,** Orchestral Concert by the Lamoureux Concert Society, conducted by Albert Wolff: Easter Overture (Rimsky-Korsakov); Tone Poem, Don Juan (R. Strauss); 'Cello Concerto (Lalo); La tragédie de Salomé (Florent Schmitt). In an interval at **9.30,** News in German. **10.30,** Dance Music on Gramophone Records.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.,** Announcements. **6.25,** See **Warsaw. 10.5,** Gramophone Records. **10.30** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Concert, relayed from **Merklin.** Marcel Paponaud (Organ). Mme. Périer Lefort (Songs) and Jean Witkowski ('Cello). Organ Solo: Sonata No. 3 (Bach); Songs: (a) Air (Bach), (b) Nocturne (César Franck); Organ Solos: (a) Fantasia in A (César Franck), (b) Scherzo (Duruflé); 'Cello Solo: Sonata in D Minor (Händel); Organ Solo: Prelude and Fugue in B (Dupré). In the interval: Talk on Organs and Organists. After the Concert: News.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12 Midnight** till Close Down, Concert by the International Broadcasting Company (Ireland), Ltd.: Signature Tune, Come back to Erin; Danza de Cosacos (Traditional); After Love (Erwin); Humming to Myself (Fain); Garbo Gitano (Bruguera); Beautiful Spring (Lincke); The Old Blind Man (Castillo); The Siege of Monte-Carlo (Heymann); Sweet Hawaiian Dreams (Coleman); Signature Tune, Come back to Erin. **12.30 a.m. (Thursday),** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Radio Journal, and Request Gramophone Records. **8.15,** Topical Review. **8.30 to 9.30,** Interval. **9.30,** Chimes, Time, and Topical Review. **9.45** (approx.), Concert by the Madrid Philharmonic Orchestra, conducted by Pérez Casas. **11.45,** Topical Review. **12 Midnight,** Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**3.0 p.m.,** Concert of Operetta Music by the Station Orchestra, conducted by Plichta: Overture, Prince Methuselah (Joh. Strauss); Selection from Boccaccio (Suppé); Waltz from The Bonbon King (Provaznik); Mazurka from Polenblut (Nedbal); Tango from Three Days of Luck (Plichta); Foxtrot Fantasia on Themes from The Merry Widow (Lehár). **3.50,** See **Prague. 5.5,** Literary Talk. **5.15,** See **Prague. 5.25,** Radio Scene with Songs by School Boys. **6.0,** See **Prague. 6.10,** Talk: The Tragedy of J. K. Tyl. **6.25** till Close Down. See **Prague. 9.15** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.—10.45, a.m.,** Weather. **1.45 p.m.,** Weather. **2.0,** Talk: The Soviet. **3.0,** German Lesson. **3.30,** Literary Programme. **4.30,** Talk: New Developments in Science. **5.30,** Concert of Ballet Music from Opera. Gramophone Records in the intervals. **8.0,** News. **8.30,** Programme Announcements. **8.55,** Chimes from the Red Square. **9.5,** Press Review **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsberg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.** (from **Nürnberg**), Concert by the Johann Schwarz Wind Instrument Orchestra: March, Männöverleben (Blankenberg); Overture, Nebuchadnezzar (Verdi); Finale from Der Wildschütz (Lortzing); Paraphase on the Song, Grüsse an die Heimat (Krome); Waltz (Newes); Selection from The Bird Fancier (Zeller); March, Kreuzritter Fanfaren (Henrion). **4.45,** Talk: Native Loyalty in German East Africa. **5.5,** Variety Programme. **5.25,** Discussion on the Legal Position between Doctor and Patient. **5.45,** Time, Weather and Agricultural Notes. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.5,** See **Berlin (Funkstunde). 7.30,** Morning, Noon and Night in Munich—a Musical Radio Sequence in Six Scenes (Kusche). **8.35,** Recital of Early German and Italian Boroque Music by Max Meili (Tenor) and Anna Speckner (Harpsichord): Lobgesang from the Sinfonia Sacra (Schütz); Tempro le cetra (Monteverdi); Toccata in D minor for Harpsichord (Froberger); Ohimè ch' io cado (Monteverdi); Toccata for Harpsichord (Senff); Three Songs (Monteverdi): (a) Ecco di dolci raggi, (b) Eri gia tutta mia, (c) Maledetto, sia l'aspetto. **9.0,** Time, Weather and News.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy LCL, 699 kc/s, 42.92 metres.—4.0 p.m.,** Gramophone Concert. **5.0,** French Lesson. **5.30,** Programme for Girls. **6.0,** Announcements, Weather and News. **6.30,** Talk: The World To-day. **7.0,** Time Signal. **7.1,** Talk: The New Roads of Norway. **7.45,** Chamber Music by the Philharmonic String Quartet: Quartet in G (Bax); Three Pieces (Gretchaninov). **8.30,** Agricultural Notes, Weather, News and Topical Talk. **9.15,** Ole Olsen Concert by the Station Orchestra, conducted by Kramm: Symphony in G, Op. 5; Petite Suite for Pianoforte and String Orchestra. **10.0** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Report, Agricultural Notes and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Orchestral Concert; Soloists, Pollicino (Tenor) and Kirner Wigney (Soprano): Overture, Egmont (Beethoven); Tenor Solos: (a) Felicità (Tronchi), (b) Venezia (De Filippis); Minuet (Boccherini); Soprano Solos: Andantino and

Cavatina from Ernani (Verdi); Teuor Solos: (a) Seconda mattinata (Tosti), (b) Con gli angioli (Savasta); Allegro (Mozart); Soprano Solos: (a) Notturno (Chopin-Rotoli), (b) Romance (Rubinstein); Waltz (Strauss). In the interval, Talk: Education in Ancient Greece. After the Concert, Gramophone Music. 10.0, Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Records of Algerian and Tunisian Music. 7.15, Le Journal Parlé. 7.30, New Gramophone Music. 8.0, Talk on Economics. 8.10 to 8.30, Interval. 8.30, Teddy and Partner Play (Yvan Noé). 10.45, Orchestral Music from the Champs Elysées Restaurant. 11.15, News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (contd). 7.45, Gramophone Music. 8.0, News. 12 Noon, Educational Talk. 12.15 p.m., Petite Suite (Debussy) on Gramophone Records. 12.30, Organ Recital from the Gaumont Palace: Melody (Munson); If you'll say yes, Chérie (Noble); Ballet Music from Hérodiade (Massenet); Look what you've done (Ruby). 1.0, Exchange, News and Weather. 1.5, Ballet Music from Opera on Gramophone Records. Ballet Music from Faust (Gounod); Le Cid (Massenet); Samson and Delilah (Saint-Saëns); Prince Igor (Borodin); and Marouf (Rabaud). In the interval at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.20, Agricultural Talk. 6.45, Book Review. 7.0, Medical Talk. 7.20, Duets from Opera on Gramophone Records. Duets from Lucia di Lammermoor (Donizetti), Romeo and Juliet (Gounod), Manon (Massenet), Mignon (Thomas) and Madame Butterfly (Puccini). 7.50, Commercial Prices and News. 8.0, Reading (François). 8.30, News. 8.40, Fashion Review. 8.45, Concert by the Lamoureux Concert Society, conducted by Albert Wolff. Soloist: Paul Tortelier (Cello); Eastern Overture, (Rimsky-Korsakov); Symphonic Poem, Don Juan (R. Strauss); 'Cello Concerto (Lalo); La Tragédie de Salomé (Schmitt). In the interval at 9.15, News.

PITTSBURGH

KDKA, 980 kc s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—7.0 p.m., Musical Originalities, from **New York.** 7.30, KDKA Home Forum. 8.0, Southern Symphonies, from **New York.** 8.15, Happy Days in Dixie, from **New York.** 8.45, Human Values. 9.0, Betty and Bob, from **New York.** 9.15, Utility Hall. 9.30, Frances Ingram. 9.45, News and Markets. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, The Singing Lady, from **New York.** 10.45, Orphan Annie, from **New York.** 11.0, News and Pat Haley. 11.15, Sports and Programme Preview. 11.30, Evensong. 11.45 to 3.30 a.m. (Thursday), **New York** Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15 a.m., Gems of Melody. 12.30, Potash and Perlmutter. 12.45, Irene Rich for Welch. 1.0, Crime Clues. 1.30, Dangerous Paradise. 1.45, Red Davis. 2.0, Warden Lawes. 2.30, John McCormack and Orchestra. 3.0, Pedro Via's Orchestra.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See **Moravská-Ostrava.** 3.50, The Bagpiper of Strakonice—Play (Tyl) with Music by Tichy, on the occasion of the Fiftieth Anniversary of the National Theatre. 4.35, Gramophone Records. 4.45, Talk: The Financier and his Profession. 4.55, Gramophone Records. 5.5, Agricultural Report. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Talk: Films and the Theatre, followed by Labour Market Report. 6.0, Time and News. 6.10, Advanced French Lesson. 6.25, Talk and Songs. 6.55, Epigrams (Josef Hora). 7.5, Symphony Concert by the Czech Philharmonic Orchestra, conducted by Nikolai Malko, relayed from the Smetana Concert Hall. Soloist: Vasa Prihoda (Violin): Symphony in B minor—The Unfinished (Schubert); Violin Concerto in D, Op. 77 (Brahms); Suite from the Nutcracker Ballet (Tchaikovsky); Overture, Tannhäuser (Wagner). 9.0, Time and News. 9.15, News in French. 9.30, (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **GENEVA, 400 kc/s, 749.9 metres.**—6.0 to 6.15 a.m. (from **Lausanne**), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from **Geneva**), Ballet Music (Glazunov) on Gramophone Records. 12 Noon (from **Geneva**), Financial Notes. 12.10 p.m. (from **Geneva**), Gramophone Concert. Part I: Sonata in F, Op. 24 (Beethoven); Part II: Light Music. 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, See **Schweizerischer Landessender.** 5.0, Programme for Children, relayed from **Malleray.** 6.0 (from **Geneva**), Talk: Charles-Edouard Guillaume and the International Weights and Measures Board. 6.30 (from **Geneva**), Les Plaideurs—a Comedy (Racine). 7.50 (from **Geneva**), Cabaret Concert. 8.50, News and Weather. 9.0 (from **Geneva**), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

NOV. 15th WEDNESDAY *continued*

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—8.0 p.m., Musical Programme. 8.10, Weather. 8.20, Musical Programme and Announcements. 8.35, Programme to be announced. 9.0, Chimes and Violin Solos by Thorarinn Gudmundsson. 9.30, Reading. 10.0, News. 10.30, Gramophone Concert: Le Carnaval des animaux (Saint-Saëns), followed by Arias.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres,** from **7.45 p.m.** and **2RO.**—**12 (Noon), to 1.15 p.m.,** Orchestral Concert: Vorrei baciarti (d'Amato); L'isola della rumba (Barzizza); Viennese Silhouettes (Gisser); Slav Dance No. 6 (Dvorák); Casa mia (Pietri); Quando mi baci (Valbrega); Waltz (Brodzsky); Isabella di Castiglia (Bootz). In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.55,** Giornale Radio, Exchange and Report of the Royal Geographical Society. **4.10,** Weather. **4.15,** Orchestral Concert: Juanita (Hamud); Fantasia on Negro Spirituals (Roder); Fantasia, Bixiana (Bixio); Spanish Waltz for Strings (Hellmesberger); Le belle di notte (Cuscinà); Hungarian Dance No. 5 (Brahms); Melody (Caslar). **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Dopolavoro and Tourist Report. **5.57,** Report of the International Institute of Agriculture (in English and Italian). **6.10,** Wheat Market Report. **6.40,** Giornale Radio. **7.0,** Time. Announcements and Gramophone Music. **7.15,** See **Turin. 7.30,** Giornale Radio and Sports Notes. **7.45,** Talk on Literature and Art. **8.0,** Relay of an Opera. In the intervals: Poems and News. Giornale Radio after the Opera.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.**—**7.30 p.m.,** Two Seats in the Balcony, from **New York. 8.0 to 8.30** (approx.), Grande Trio, from **New York. 12.45 a.m. (Thursday),** Stock Reports. **1.0,** George Olsen's Orchestra, from **New York. 1.30,** Concert. **2.0 to 3.30, New York** Relay. **2.0,** Ipana Troubadours. **2.30,** Leo Reisman's Orchestra. **3.0,** Variety Programme. **3.30,** National Radio Forum, from **New York,** followed by Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **11.0** (from **Berne**). Songs of Paris on Gramophone Records. **11.29,** Time Signal from Neuchâtel Observatory. Weather and News. **11.40** (from **Berne**), Folk Music on Gramophone Records. **12.25 p.m.** (from **Berne**), Time, Weather and Exchange. **12.30** (approx.) **to 2.30,** Interval. **2.30** (from **Berne**), Schumann and Schubert Song Recital on Gramophone Records. **2.59,** Time Signal from Neuchâtel Observatory. **3.0** (from **Berne**), Concert by the Al Berlin Orchestra. **4.0,** Tauber Song Recital (on Gramophone Records). **4.30,** Chamber Music. **5.0** (from **Berne**), Programme for Children. **5.30** (from **Zürich**), Talk: Unknown Parts of Europe. **6.0** (from **Zürich**), Time, Weather and Market Prices. **6.20** (from **Zürich**), English Lesson. **6.50** (from **Zürich**), La Bohème—Opera (Puccini), relayed from the State Theatre. In the interval at **8.0,** (approx.). Weather and News. **9.30** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**12 Noon to 12.30 p.m.,** Broadcast for Schools. **4.5,** Radio Report. **4.30,** Gramophone Music. **5.15,** Religious Reading, relayed from the Uppsala University. **6.0,** Gramophone Music. **6.15,** Weather and News. **6.30,** Talk. **7.5,** Concert on Electrical Instruments, relayed from **Berlin (Funkstunde). 8.0,** Reading. **8.20,** Pianoforte Recital by Walter Meyer-Radon, relayed from **Malmö, 1,301 kc/s, 230.6 metres:** Kinderszenen (Schumann); Extracts from the Children's Corner (Debussy); Pezzi Infantili (Casella). **8.45,** Weather and News. **9.0,** Dance Music, relayed from Bern Hall. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Gramophone Concert of Light Music. **12.45 p.m.,** News. **1.0,** Time and Exchange. **1.5,** Popular Music on Gramophone Records. **2.0,** Interval. **4.45,** Talk on Electricity. **5.0,** Orchestral Concert, conducted by Roskam. Two Step, Pontenero (Heymann); Schatzwalzer (Joh. Strauss); Prelude and Dance from Das Pensionnat (Suppé); Foxtrot, April (Allbuche); Foxtrot, Golden River (Allouche-Stower); Selection from Madame Cupidon (Hesse); Tango, El Rosal (Lucchesi); Shadow Waltz (Dubin and Warren); Saxophone Solo: Simple aveu (Thomé); Ninon quand tu me souris (Kaper-Jurmann); Intermezzo (Kalkman); Don't be late in the Morning (Leclercq-Mendoza). **6.0,** Trio Concert, relayed from **Lille, 1,128.5 kc/s, 265.8 metres. 7.0,** Talk: International Transport Methods. **7.15,** Talk in German: The Skilled Trades. **7.30,** Time and News. **7.45,** Programme for Children relayed from **Paris (Eiffel Tower (1,445.7 m.,** 13 kW.). **8.0,** Press Review in German, Lottery Results and Announcements. **8.30,** Concert of Alsatian Music by the Station Orchestra and Soloists. Conductor: Maurice de Villers. Suite in D Minor (Erb); Two Songs (Erb): (a) Berceuse, (b) La barque; Two Pieces (Erb): (a) Menuet galant, (b) Ronde de nuit; Two Pieces (Gross): (a) Cette petite (b) D'r Hans; Scènes foraines dans un village d'Alsace (Klein; Two Songs (Gross): (a) Filense, (b) Berceuse; Two Pieces (Schirlé): (a) Pastorale, (b) Fileuse; A la Source de Mont Sainte-Odile (Schirlé); Three Pieces (North): (a) Le jardin secret, (b) Les roses, (c) Ariette oubliée; Suite asiatique (Pohl); Sextet for Strings (Adam). In an interval at **9.30** (approx.), Press Review. **10.30,** Orchestral Concert, conducted by Jemine, relayed from the Grand Kléber Tavern. March, Novelty (Pelloud); Waltz, Les sirènes (Waldteufel); Overture, Zampa (Hérold); Lehár Potpourri (Hruby); Selection from La fille de Madame Angot (Lecocq); Potpourri of 1929-30 Successes (Dostal). **11.30** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**11.0 a.m.,** See **Langenberg. 12.15, p.m.,** See **Frankfurt. 12.25,** News. **12.35,** Concert by the Station Orchestra, conducted by Gustav Görlich: Overture, Die Felsenmühle (Reissiger); Idyll (Svendsen); Waltz from Gipsy Love (Lehár); Paraphrase on the Song, Grün ist die Heide (Blume); Waltz, Wiener Bürger (Ziehrer); Apollo March (Lincke). **1.30,** Programme for Children. **2.30,** Songs and Trios by Elizabeth Jentsch (Soprano), Karl Jantz (Tenor) and Karl Jentsch (Baritone). **3.0,** Concert by the Station Orchestra, conducted by Gustav Görlich. Part I, Dances of the Nations: German Dances (Hasenöhrl); Dolls' Minuet (Mello); Eskimo Dance (Frederiksen); Slovak Dance (Felber); Spanish Waltz, Torero (Translateur); Czardas (Grossmann); Farandole (Bizet). Part II, Dance Music. **5.0,** German for Germans. **5.20,** Economic Notes. **5.30,** See **Berlin (Deutschlandsender). 6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** See **Frankfurt. 7.10 to 9.0,** See **Langenberg. 9.0,** See **Frankfurt. 9.20,** Things you should know. . . . **9.30,** News. **9.45,** Gramophone Music. **10.0,** Perpetuum mobile—Musical Potpourri by the Station Orchestra, conducted by Gustav Görlich, and Soloists. **11.0,** Serenade. **12 Midnight** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—**6.15 p.m.,** Music by a Viennese Orchestra. **6.30,** Operetta Music: Airs from Miss Decima (Audran), Mariska (Cazes), Brummel (Hahn) and Le Coups de roulis (Messager). **6.50,** Norwegian Dance (Grieg), followed by Talk and Minuet in G (Beethoven). **7.15,** News. **7.30,** La Fête du couronnement de la Muse (Charpentier) by a Symphony Orchestra. **7.45,** Light Music. **8.0,** Military Music. **8.15,** Opera Music: Airs from Les Dragons de Villars (Maillart), Si j'étais Roi (Adam), Madame Butterfly (Puccini), and La Bohème (Puccini). **8.30,** Accordion Solos. **8.45,** Orchestral Music. **9.0,** Concert Version of The Land of Smiles—Operetta (Lehár). **9.30,** Opera Music: Prelude to the Fourth Act of Werther (Massenet); Selection from Tosca (Puccini); Overture, Carmen (Bizet); Ballet Music from Manon (Massenet). **9.45,** Chansonnettes. **10.0,** Orchestral Music. **10.15,** News. **10.30,** Concert for Listeners in Morocco. Part I: Extracts from Sound Films; Part II: Music by a Symphony Orchestra: Dances from Salomé (Strauss); Selection from Alessandro Stradella (Flotow); Slav Dance No. 8 (Dvorák). **11.0,** Opera Music: Vision fugitive from Hérodiade (Massenet); Air from The Tales of Hoffmann (Offenbach); Duet from Act I of Faust (Gounod). **11.15,** Dance Music. **12 Midnight,** News. **12.5 a.m. (Thursday),** Hawaiian Guitar Solos. **12.15,** Musical Programme. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.,** Song Recital. **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Weather and Gramophone Music. **6.0,** Time, Tourist Talk and Gramophone Music. **6.10,** Agricultural Notes and Market Prices. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** News and Weather. **7.15,** Medical Talk. **7.30,** Gramophone Music. **8.0,** Opera Relay. In the intervals, Talk and Announcements. After the Opera, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in Spanish. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: March Hoch Leopold! (Ertl); Overture, Cagliostro in Wien (Joh. Strauss); Variations on the Theme 's kommt ein Vogerl geflogen (Ochs); Waltz, Bad'ner Mad'ln (Komzak); Song, Kleines Trompeterlein, Grüss Gott, ade (Stolz); Song, Das Leben ist ein schweres Geschäft (Eysler); Minuet and Barcarolle from The Tales of Hoffmann (Offenbach); Potpourri of Popular Songs (Dostal); Overture, Im Reiche des Indra (Lincke); Waltz Finale from A Waltz Dream (O. Straus); Serenade, Liebeserklärung (Bauer); Song, Wunderhar ist der Duft von deinem Haar (Sieczynski); Waltz, Junge Mädchen tanzen gern (Eysler); Ein Rätsel ist das Frauenherz (Jos. Strauss); Potpourri, An Alle! (Uhl). **1.0 p.m.,** Interval. **2.0,** Time and Announcements. **2.15,** Concert by the Brandi Trio: Trio in E, Op. 15, No. 2, for Violin, 'Cello and Pianoforte (Mozart); Trio in D minor, Op. 49, for Violin, 'Cello and Pianoforte (Mendelssohn). **3.15,** Reading (Hans Mittendorfer). **3.45,** Gramophone Concert: Overture, Die Fledermaus (Joh. Strauss); Prelude in C sharp minor (Rachmaninov); Waltz, Fascination (Marchetti); Rheinländer Potpourri (Robrecht); Offenbach Potpourri (Conradi-Daehlitz); Two Pieces from Carmen (Bizet); Bolero (Ravel-Branga). **4.25,** Talk with Gramophone Illustrations: Portugal's Sunny Coast. **4.55,** The Dusk of the Gods—Opera (Wagner), relayed from the State Opera House. In the interval at **7.0** (approx.), Time and Announcements, and at **8.25** (approx.), Announcements. **9.50,** Talk: Winter Sports in Austria. **10.0,** Variety Music on Gramophone Records, followed by Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5,** Gramophone Music. **11.30,** Radio Journal. **11.35,** Weather Report. **11.38,** Quartet (Beethoven) on Gramophone Records, with Introductory Talk. **12 Noon,** Interval. **2.30,** Agricultural Notes. **2.40,** Trio for Hunting Horn, Pianoforte and Violin (Brahms). **3.10,** Programme for Children. **3.40,** Answers to Technical Correspondence. **3.55,** Soprano Solos. **4.20,** Pianoforte Recital by Mme. Melman-Ciechanowska: Pastorale (Scarlatti); Variations, Op. 116, No. 3 (Paderewsky); Mazurka in C sharp minor (Chopin); Mazurka in A minor (Chopin); Prelude in G minor (Rachmaninov); Waltz (Strauss-Grünfeld). **4.50,** Agricultural Correspondence. **5.0,** Talk: Latin as an International Language. **5.20,** Light Orchestral Music, relayed from the Gastronomia Café. **6.5,** Miscellaneous Items. **6.25,** Reading. **6.40,** Programme Announcements. **6.45,** Radio Journal. **7.0,** Talk for the Fifteenth Anniversary of Polish Independence. **7.15,** Song and Guitar Recital. **8.15,** Talk. **8.30,** Violin Recital by Robert Soetanas: Sonata, Le Tombeau (Leclair); Poème (Chausson); Le Printemps (Milhaud); Malaguena (Albéniz); Montaguarde (Nin-Kochanski); Granadina (Nin-Kochanski). **9.15,** Sports Notes. **9.25,** Dance Music from the Café Adria. In an interval at **10.0,** Aviation Weather Report and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

THURSDAY

NOVEMBER THE SIXTEENTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes. **7.15,** Agricultural Report and Weather Forecast. **7.20,** Opera Music. **7.55,** News. **8.0,** Time and Lottery Results. **8.10,** Talk: Strange Facts and Hobbies. **8.25,** News. **8.30,** L'Illustre Gaudissart—Comedy in One Act (after Balzac). **9.0,** Request Gramophone Concert. **9.35,** News. **9.40,** Request Gramophone Concert (contd.). **9.55,** News. **10.0,** Concert of Oriental Music.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time, Weather, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.40,** News. **7.10,** French Lesson. **7.15,** Recitation of Poems. **7.30,** Time. **7.31,** Concert by the Station Orchestra. **8.0,** A Sketch presented by Mary Sheridan and Company. **8.30,** Pianoforte Recital by Sydney Green. **8.45,** Tenor Solos by P. J. O'Toole. **9.0,** The Station Orchestra. **9.15,** Soprano Solos by Eileen Driscoll. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Variety Music: Intermezzo, Pierrette's Wedding (Jordon); The Shadow Waltz (Dubin); Octet: Waltz from Der Rosenkavalier (R. Strauss); Song: Drake's Drum (Newbolt); Moonstruck (Dubin); Violin Solo: Valse bluette (Drigo); Song of the Vagabond from The Vagabond King (Friml); Over the Waves (Rosas). **10.0,** Concert of Dance Music, arranged by the International Broadcasting Company (Ireland), Ltd.: If I had somebody to love; To-night; Sophisticated Lady; Moonstruck; I guess I'll have to change my plan! Let's call it a Day; Stay out of my Dreams. **10.30,** I.B.C. Good-night Melody, followed by News and Weather. **10.40,** Traditional Music. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 853 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert. In the interval: Talk. **7.0,** Request Gramophone Records. **7.15,** Talk on Hygiene. **7.30,** Exchange and Gramophone Records (contd.). **8.0,** Gramophone Music and News. **8.30,** Educational Programme: Geography and History Lesson. **9.0,** Chimes from the Cathedral, Weather, Exchange, and Market Prices. **9.5,** Concert by the Radio Orchestra: March (Gangiberger); Selection from Los borrachos (Jimenez); Waltz, Etincelles (Waldteufel); Popular Romanian Dances (Béla Bartok); Serenade (Desprez); String Quartet: La oracion del torero (Turina). **10.0,** De bon Tremp—Catalan Play in Three Acts (Folch and Torres). In the interval at **11.0,** News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Women. **3.50** (approx.) **to 7.0,** See **Rome. 7.0,** News in Albanian. **7.30** (approx.) till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**5.55 p.m.,** Time and Announcements. **6.0,** Popular Music on Gramophone Records. **6.10,** Talk. **6.30,** Talk. **7.0,** Recital of Yugoslav Songs. **7.30,** Violin Recital. **8.10,** A Radio Play. **8.30,** Popular Songs. **9.10,** Time and News. **9.25** (approx.), Orchestral Music. **9.45,** Dance Music from the Auto Club.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**11.5 a.m.,** Gramophone Concert: Wedding Music (Jensen); Ballet Suite (Popy); Waltz (Brahms); Mozart Potpourri; Overture, Fasching (Schmalstich); Four Norwegian Dances (Grieg); Caucasian March (Ippolitov-Ivanov); Tchaikovsky Potpourri. After the Concert, Weather. **11.55,** Time Signal. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Gramophone Concert (contd.): Melody (Cahrmilé); Waltz from Schlagobers (R. Strauss); Japanese Romance, Poppies (Moret); Waltz, Roses from the South (Joh. Strauss); Rhenish Song (Hannemann); Die Loreley (Silcher); Souvenir (de Micheli); Aus dem Hochswald (Moar); Puszta-Grüsse (Kiss); Der Zirkus kommt (Rust); The Whistler and his Dog (Pryor); Neapolitan Nights; Potpourri of Gipsy Music; Zigeuner spielen; Treu sein, das liegt mir nicht (Strauss); La cinquantaine (Gabriel-Marie). **1.45,** Programme for Children. **2.10,** Programme for Young People. **2.30,** Weather and Exchange. **2.45,** Reading (Tieck). **3.0,** See **Heilsberg. 4.0,** Talk for Women on Photography. **4.20,** Concert of Operetta and Sound Film Music by Ludwig Rüth and his Orchestra; Soloists: Inge Torren (Soprano) and Walther Ludwig (Tenor). **5.0,** Poems. **5.5,** Humorous Programme. **5.30,** Radio Report: Vicious Horses. **5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** To-day's Quotation. **7.5,** The German Calendar—November. **8.0,** Concert by the University Orchestral Society, conducted by Richard Hagel. **9.0,** Weather and News. **9.45,** Weather. **10.0,** Dance Music from **Breslau. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s. 419 metres; 1.5 kW.—Relayed by **Zeesen, DJC, DJA, DJD, DJB** and **DJE.—6.0 p.m.,** Transmission for all German Stations, relayed from **Breslau. 7.5,** Von deuscher Seele—Romantic Cantata Op. 28 (Pfitzner), by the Bruno Kittelscher Choir and the Berlin Philharmonic Orchestra, conducted by the Composer. Soloists: Anita Oberländer (Soprano), Maria Peschken (Contralto), Heinz Marten (Tenor); Fred Drissen (Baritone), and Hans Göhler (Organ). **9.0,** News. **9.15** (approx.), Light Music on Gramophone Records. In the interval at **10.0,** Variety Item. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN:—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.3 metres; 14 kW.—**3.50 p.m.,** Programme for Children. **4.15,** Talk. **4.25,** Gramophone Music. **4.35,** See **Prague. 4.50,** Pianoforte Recital by Libuse Svohodova: Preludes Nos. 1 and 2 (Barvinsky); Reminiscences, Op. 6 (Novak). **5.15,** Reading. **5.30,** Recital of Moravian and Slovak Folk Songs by Helena Bartosova. **5.55,** Hints for the Housewife. **6.0 to 9.15,** See **Prague. 9.15,** See **Brno. 10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,186 kc/s, 253.1 metres.—10.45 a.m.,** Concert by the Silesian Philharmonic Orchestra, conducted by Wolfgang Fricbe. Suite from Sylvia (Delibes); Overture, Peter Schmoll (Weber); Selection from La Traviata (Verdi); Hungarian Rhapsody (Reindel); Ballet Music, Piazza del Popolo (Frederiksen); The Emperor Waltz (Joh. Strauss); Hungarian Dances, Nos. 5 and 6 (Brahms); Overture, Berlin, wie es weint und lacht (Conradi); Selection from The Merry Widow (Lehár); Polka Mazurka, Frauenherz (Joh. Strauss); Potpourri, Auf Wiederhören (Weninger). **12.45 p.m.,** Time and News. **1.10,** Violin Recital on Gramophone Records. Ständchen (Schubert); Nocturne (Chopin); Canzonetta (d'Ambrossio); Melody (Gluck); Zigeunerweisen (Sarasate); Andantino (Martini); Träumerei (Schumann). **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.20,** Programme for Children. **2.50,** Talk: Suggestions for Autumn Excursions in the Katzengebirge. **3.0,** See **Heilsberg. 4.30,** Agricultural Prices. **4.35,** Talk: Hans Grimm—a Nazi Author. **4.55,** Programme to be announced. **5.20,** A Discussion between Workers and their Leaders. **5.45,** Programme Announcements. **6.0,** Transmission for all German Stations: The German Peasant—Play (Ernst Keienburg), with Incidental Music by Johannes Rietz. **7.0,** News. **7.5,** See **Berlin (Funkstunde). 9.0,** Austria. **9.20,** Time and News. **9.50,** Dance Music by the Station Band, conducted by Ernst Topitz. **11.30** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Bakala: Concert Overture (Schor); Melody (Musil); Serenade for String Orchestra (Pek); Moravian Dance (Konrad); Slovak Dance (Konrad); Baroque Suite, Op. 23 (Atterberg). **3.50,** See **Bratislava. 4.15,** Talk for Young People. **4.25,** Gramophone Records. **4.35,** See **Prague. 4.50,** Song Recital. **5.0,** Theatre and Film Notes. **5.15,** See **Prague. 5.25,** German Transmission: News and Rudolf Peterka Concert. **6.0,** See **Prague. 9.15,** Symphonic Poem, Wallenstein's Camp (Smetana), by the Station Orchestra, conducted by Sachs, with Introductory Talk. **10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Concert of Variety Music. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: Strauss March (Mezzacapo); Petite suite (Kalkman); Chanson d'amour (Caludi); Selection from The Czarevitch (Lehár); Pianoforte Solo: Marigold (Mayerl); Waltz from One Hour with you (O. Straus); Potpourri of Popular Airs, A Voyage around the World (Salabert). **5.0,** The French Revolution—Gramophone Concert: Hymne à la liberté (Gossec); Hymne à la (Gossec); Melody Popular Songs: (a) Ca ira and, (b) La Carmagnole; The Marseillaise (d l'Isle); Le chant du départ (Méhul-Dupont); Overture, Maximilien Robespierre (Litolff). **5.30,** Musical Programme for Young People. **6.0,** Cookery Talk. **6.15,** Gramophone Music: Waltz (Waldteufel); Rondo brillant (Weber); Two Extracts from The Cid (Massenet). **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Tartuffe (La Gye); Ballet Music from Ascanio (Saint-Saëns); Tendresse et passion (Lagarde); Selection from Mam'zelle Sourire (Lachaume); Violin Solo: La source (Mussorgsky-Dushkia); Suite pour mes petits amis (Pierné). **7.15,** Talk for Workers. **7.30,** Sports Notes. **8.0,** A Midsummer Night's Dream (Mendelssohn), on Gramophone Records. **8.10,** Variety Programme. **8.45,** Talk: Advice for the Small Cultivator. **9.0,** Concert by the Radio Orchestra, conducted by Charles Walpot: March (Weyts and François); Suite of Waltzes; In the Valley of the Isar (Löhr); Overture, Semiramis (Rossini); Selection from: (a) The Land of Smiles (Lehár), (b) Rip (Planquette), (c) Cocorico (Ganne); Walloon Suite (Wangermée); Extracts from the Suite, La Feria Lacôme). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW.—Programme in Flemish. **12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans: Soloist: Yvonne Verbeeck (Songs); Overture, Light Cavalry (Suppé); Waltz, Wiener Bonbons (Joh. Strauss); La ronde des lutins (Bazzini); Potpourri of Dutch Songs (Shuyter-Hoogenboom); Hullebroeck Potpourri (Wiggelaar); Songs; Selection from L'Arlésienne (Bizet). **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert with Songs by Yvonne Verbeeck: Overture, The Thieving Magpie (Rossini); The Funeral March of a Doll (Gounod); Songs: Mascarade (Lacôme); March from Aïda (Verdi). **5.0,** Concert by the Radio Orchestra, conducted by Walpot: March of the Marionettes (Hullebroeck); Spanish Fantasia (Gevaert); Aubade à Kiki (De Boeck); Selection from Mirella (Gounod); Ballet Suite, Mascarade (Lacôme). **5.45,** Programme for Children. **6.30,** Gramophone Concert: Gnomenparade (Noack); In a Persian Market (Ketelbey); Melody (Siede); Waltz, Wo die Zitronen bluh'n (Joh. Strauss); The Old Musical Box (Humphries); Humorous Scenes (Leonard); Potpourri of Popular Airs (Dostal). **7.0,** Lecture Recital. **7.30,** Talk for the Housewife. **8.0,** Concert by the Radio Orchestra, conducted by Walpot: March, The Picador (Sousa); Overture, Martha (Flotow); Selection from Viktoria and her Hussar (Abraham); Stephanie Gavotte (Czibulka); Three Pieces (Myddleton): (a) Down South, (b) The Phantom Brigade, (c) The Last Horse-Tram. **8.45,** Talk: The Fleming as a City-Dweller. **9.0,** Popular Music on Gramophone Records. **9.50,** Evening Prayer. **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Variety Music by the Dinico Orchestra. In an interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.40,** The Barber of Seville—Opera in Four Acts (Rossini), on Gramophone Records. In the intervals, Reading and Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **6.35 p.m.** till Close Down.—**4.30 p.m.,** Concert by the Losonezi Schweitzer Orchestra, relayed from the Spolarich Café. **5.0,** English Lesson. **6.0,** Poetry Reading. **6.35,** Concert of Madrigals, conducted by Bela Endro. Introductory Talk: Madrigal (Palestrina); Zefiro (Monteverdi); Song (Donati); Spanish Madrigal; Three Flemish Madrigals: (a) Song of Farewell (Isaac). (b) Farewell (Josquin), (c) Married Life (Lassus); April is in my mistress' face (Morley); Le enquet des femmes (Jannequin); Ach Liebe (Sies); Der Kölner Markt (Zangius). **7.40,** News and Sports Notes. **8.0,** Concert by the Gyula Csorba Cigány Band, relayed from the Baross Café. **9.30,** Weather. **9.45** (approx.), Concert by the Royal Opera House Orchestra, conducted by Sámy. Overture (Eszterhézy); Symphonic Poem (Recli); Polish Rhapsody (Filtenberg); Symphony No. 2, Antar (Rimsky Korsakov).

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m.,** Time and Chimes from the Town Hall. **11.0 to 1.0 p.m.,** Music by the Leonard Gyldmark String Ensemble, relayed from the Bellevue Strandhotel. **1.40,** Song Recital: Airs from The Merry Widow (Lehár); A Waltz Dream (O. Straus); and Alexandra (Szirmai); Song (Stolz). **2.0,** Orchestra Music, relayed from the Wivex Restaurant. **3.45,** Broadcast for Boys. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: Japanese Handwork. **5.15,** English Lesson. **5.45** Weather. **6.0,** News. **6.15,** Time. **6.16** Talk: Democracy and Dictatorship? **6.45** Danish Lesson. **7.10,** Concert by the Radio Symphony Orchestra, conducted by Fritz Busch. Soloist: Gastar Cassodo (Cello): Symphony No. 3 in E flat, Op. 55—The Eroica (Beethoven); 'Cello Concerto on Themes from the Arpeggio Sonata (Schubert Cassado); Symphonic Poem, Don Quixote (R. Strauss). **9.15,** News. **9.30,** Reading. **9.50,** Dance Music, relayed from the Lodberg Restaurant. **11.0,** Time and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**6.5 p.m.** The Letter Box. **6.20,** Miscellaneous Items. **6.25,** See **Warsaw.** In the interval at **6.40** Programme Announcements, and at **9.0** Sports Notes. **10.30** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**10.30 to 11.30 a.m.,** Programme in English by the I.B.C. Happy Hour. Part I, Orchestra Concert: Signature Tune; Princess Pat (Herbert); Rosa Mia (Guizar); Pianoforte Solo: Tony's Wife (Adamson); In the Valley where the Bluebirds sing (Salman); March La Czarine (Ganne); Serenade (Herbert) Pianoforte Solo: Waltz Time Medley (Strauss); Veleta Medley (Varney). Part II, Dance Music: Dancing Butterfly; Snowball; Moths around the Candle Flame Shadows on the Swanee; Cecilia Mia; Dancing to save your Sole; It's not a secret any more; I'll take an Option on you Signature Tune. **11.30,** French Programme. **4.30 to 6.0,** Programme in English by the I.B.C. **4.30,** I.B.C. Nursery Corner with Columbus and Belinda: Birthday Greetings Trumpets. **4.40,** Concert for Worthing and Littlehampton Listeners. Organ Recital Signature Tune: The Night by the Sea Potted Overture (arr. Engleman); A Cuckoo in the Nest (Sievier); Song: Over the Dark Still Silence (Rizza); Gilbert and Sullivan Potpourri; Unrequited Love (Lincke) Waltzland Selection (arr. Stoddon); Un peu d'amour (Silésu); Chant sans paroles (Tchaikovsky: Song: The Sea Road (Haydn Wood) La Serenata (Braga). **5.20,** Orchestral Concert for Brighton and Hove Listeners: The Dance of the Raindrops (Reeves); The Wedding of the Birds (Petersen); The Clock is playing (Blauuw); At Dawning (Cadman). Pale Volga Moon (O'Hagan); By the Sleepy Lagoon (Coates); Barcarolle (Waldteufel); Signature Tune. **5.45,** Concert of Dance Music: Let's make up; Sing another line; Mi Amor esta en el valle; Isn't this a Night for Love?. **6.0,** French Programme. **10.0** till Close Down, Programme in English by the I.B.C. **10.0,** Dance Music: Signature Tune: The Bells of Normandy; Ding, Dong Ding; I'll take an Option on you; Trouble in Paradise; Mary Rose; The Wedding of Mr. Mickey Mouse; Nunca—Tango; The Last Round Up; Reflections in the Water; I've found the Right Girl; Isn't this a Night for Love?; Lazybones; Wedding of the Dragon Flies; Dance Pretty Lady; Sweet Dreams Pretty Lady; Carry me back to Green, Green Pastures; Then the Moon came out; I'll show you off; Signature Tune. **11.0,** Talkie Time. Tunes from the Talkies and Shows: Signature Tune: Sittin' in the Dark; Experiment (Porter); Shuffle off to Buffalo (Dubin); Song: In a Year, in a Day (Heymann); Selection from Gold Diggers of 1933 (Dubin); I'll show you off (Abraham); Look what you've done (Kalmar); Song: Truly Rural Gentleman (Heymann); Let me give my happiness to you (Posford); Signature Tune. **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Signature Tune: Come back to Erin; Pride of the Wolferines (Sousa); Idylle Bretonne (Gennin); Pan and the Wood Goblins (Rathke); Come Cigány, from Countess Maritza (Kálmán); Irish Song Medley; Spring Blossoms Awaken (Löhr); Song: Fairy Tales of Ireland (Coates); Amina (Lincke); Signature Tune: Come back to Erin. **12.5 a.m. (Friday),** I.B.C. Late News Bulletin. **12.10** (approx.), Club Concert for Soham Listeners: Signature Tune: The Chum Song; Let the world go drifting by (Leon); Egypt (Wallace); Let's all be happy together (Leslie); Dawn in Montmartre (Demare); Lover (Rodgers); I've got to pass your House (Brown); My Kingdom for a Smile from you (King); Sing another Line (Carson); Let's make up (Little); Spanish Eyes (Kester); Tick, Tock (Vienna); Stay out of my Dreams (Washington); Little Miss Muffett (Perritt); Signature Tune. **1.0 a.m.,** Light Music: Animal Antics (Wark); When day is done (de Sylva); The Porter's Love Song (Johnson); Sweetheart I'm dreaming of you (Desmond); Marching through Georgia (Work); No more Love (Friend); In Tulip Time beside the Water Mill (Ailbout); Beautiful (Gillespie). **1.30,** Accordion Band Music: 'Leven Pounds of Heaven;

C'est un petit nid; Waltz, My Florence; The Old Rustic Bridge by the Mill; Mona Lisa; The Blue Danube; After the Ball; Whistling Waltz. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel, 1,220 kc/s, 245.9 metres;** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.35,** News and Weather. **12.35,** See **Langenburg. 1.40,** Programme for Young People. **2.30,** Weather. **2.40,** Time and Economic Notes. **3.0,** Concert by the Station Orchestra, conducted by Merten (Pianoforte). Soloists: Schmitt-Walter (Baritone), Gustav Lenzewski (Violin), Senfert (Pianoforte) and Liane Finus (Soprano); Extracts from Die Königskinder (Humperdinck); Prelude to Hansel and Gretel (Humperdinck); Overture, Alessandro Stradella (Flotow); Baritone Solos: (a) Serenade from Don Giovanni (Mozart), (b) Cavatina from The Barber of Seville (Rossini); Overture, Il Seraglio (Mozart); Violin and Pianoforte Sonata in D, Op. 12, No. 1 (Beethoven); Reading; Baritone Songs with Pianoforte Accompaniment (Jensen): (a) Murmelndes Lüftchen, (b) Wie Lenzeshauch, (c) Am Ufer des Flusses Manzanares, (d) Margret am Tore Overture, Gasparone (Millöcker); Songs from Operetta. Overture, Isabella (Suppé); Songs from Operetta, Overture, Der Waldmeister (Strauss). **5.0 to 5.35,** See **Stuttgart. 5.35,** Talk: A Hundred and Twenty-Five Years of the Frankfurt Museum Society. **5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** Topical Talk. **7.10,** See **Langenberg. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** News and Weather. **9.40 to 12 Midnight,** See **Langenberg. 12 Midnight,** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m.,** Transmission for all German Stations, relayed from **Breslau. 7.0,** Public Concert by the Hamburg Philharmonic Orchestra and Soloists, in aid of the Winter Fund, relayed from the Musikhalle. Conductor: Eibenschütz. Overture, Der Freischütz (Weber); Quartet from Fidelio (Beethoven); Entr'acte from Rosamund (Schubert); Vocal Quartet and Pianofortes: Liebeslieder-Walzer (Brahms); Symphonic Poem Les Preludes (Liszt); Wotan's Farewell and Fire Magic from The Valkyrie (Wagner); Overture to Kleist's Kätchen von Heilbronn (Pfitzner); Duet from the First Act of Mona Lisa (Max von Schillings); Symphonic Poem, Till Eulenspiegel's Merry Pranks (R. Strauss). In the interval, News. **9.0,** News. **9.15,** See **Berlin (Funkstunde).**

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert of Slav Music. In the interval at **12.20** and **1.0,** News. **1.30** (from **Danzig**), Exchange. **2.0,** Agricultural Prices. **2.30** (from **Danzig**), Programme for Young People. **3.0,** Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner: Overture, Des Teufels Lustschloss (Schubert); Orchestral Suite (Tchaikovsky); From the Fields and Groves of Bohemia (Smetana); Overture, A Life for the Czar (Glinka). **4.30,** Recital of Contemporary Songs by Hans Eggert (Baritone). **4.55,** Elementary English Lesson. **5.15,** Agricultural Prices. **5.25** (from **Danzig**), Agricultural Talk. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** News. **7.10,** Brahms Folk Songs by the Station Choir, conducted by Paul Firchow: Ach Gott, wie weh tut scheiden; Wach' auf, meines Herzens Schöne; Erlaube mir fein's Mädchen; Es wohnet ein Fiddler zu Frankfurt am Main; Da unten im Tale; Des Abends kann ich nicht schlafen gehn; Wach' auf meines Herzens Schöne (Second Version); Dort in den Weiden; Verstohlen geht der Mond auf; Es stunden drei Rosen; Es war einmal ein Zimmergesell; Wir stehen hier zur Schlacht bereit. **8.0,** Demonstration of Welcome to the National Sport Leader, relayed from the Stadthalle, **Königsberg. 9.0,** News. **9.30,** Talk by Kurt G. Sell: What People are talking about in America, relayed from **Washington.**

NOV. 16th THURSDAY *continued*

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.** Programme of the General Broadcasting Society (A.V.R.O.).—**11.40 a.m.,** Time Signal. **11.41,** Concert by the Station Orchestra, conducted by Nico Treep. In the intervals, Gramophone Records. **1.55 p.m.,** Interval. **2.10,** Concert (contd.): Overture, Der Erlenhügel (Kuhlau); Kamarinskaya (Glinka); Les Néréides (Brusselmans); Melody (Ravel). **2.40,** Dressmaking Lesson. **3.25,** Gramophone Records. **3.40,** Programme for Hospitals. **4.10,** Concert by a Women's Choir, conducted by Jans Bierma. **4.40,** Interval. **5.10,** Concert of Light Music by Kovacs Lajos and his Orchestra. In the interval at **6.10,** Sports Talk. **7.10,** English Lesson. **7.40,** Time Signal. **7.41,** News. **7.45,** Gramophone Records. **7.55,** Concert by the Concertgebouw Orchestra, conducted by Pierre Monteux, relayed from the Concertgebouw, **Amsterdam:** Soloist: Carel van Leeuwen Boomkamp ('Cello); Overture in Italian Style (Schubert); 'Cello Concerto (Röntgen); Symphonic Poem, Istar (d'Indy); Variations for String Orchestra (Arensky); March from The Loves of the Three Oranges (Prokofiev). In the interval, Gramophone Records. **10.10,** Concert of Light Music by Kovacs Lajos and his Orchestra. **10.40,** News. **10.50,** Gramophone Records. **10.55,** Concert (contd.). **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. **3.40 p.m.—11.55 a.m. to 1.40 p.m.,** Programme of the Catholic Radio Society (K.R.O.). **11.55,** Concert by the K.R.O. Orchestra, conducted by van 't Wond: Frisch gewagt (Blon); Overture, Fatinitza (Suppé); L'Angelus de la mer (Goublier); Gavotte tendre (Ganne); Joyous Youth (Coates); Mephistos Spiel (Dreyer); Waltz, Dolorès (Waldteufel); Gramophone Records; Selection from A Waltz Dream (O. Straus); Mosaik (Zimmer); Indian Canzonetta (Dvorák); Overture, Maritana (Wallace). **1.40** till Close Down, Programme of the Christian Radio Society (N.C.R.V.). **1.40,** Handicrafts Lesson. **2.40,** Gramophone Music. **3.10 to 3.40,** Interval. **3.40,** Bible Reading and Sacred Music by Smit Duyzentkunst (Organ) and J. Smit Duyzentkunst (Baritone). **4.40,** Handwork Lesson for Young People. **5.10,** Concert by the Hague String Trio: Trio No. 2 in G (Beethoven); Gramophone Records; Trio in D minor (Reger). **6.10,** Talk. **6.25,** Gramophone Music. **6.40,** Police Notes. **6.55,** Religious News. **7.20,** Press Review of the Week. **7.40,** Commemoration Service, relayed from the Groote Kerk, **Rotterdam:** Address by J. Donner; Concert by Mme. Offers (Mezzo-Soprano), Orobio de Castro (Violin), Van den Brink (Flute), Besselaar (Organ), and the Concordia Male Voice Choir conducted by Tobé. **9.40,** News, followed by Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results and News. **8.10.** Fashion Review. **8.45,** News and Weather. **9.0,** Recital of Granados and Albeniz Music.

KALUNDBORG.—See **Copenhagen.**

KEIL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.15 p.m.,** See **Frankfurt. 12.25** News. **12.35,** Concert of Military Music by the Station Male Voice Choir, conducted by Josef Breuer and the Station Orchestra, conducted by Kühn and Soloists. **1.0,** Gramophone Music. **2.30,** Economic Notes. **2.50,** Political Announcements. **3.0,** See **Frankfurt. 5.0,** See **Stuttgart. 5.35,** Violin and Pianoforte Recital by Fritz Hoffmann and Walter Wielsch. Sonata in G Minor (Tartini); Romance (Svendsen). **5.50** Announcements. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** See **Frankfurt. 7.10,** Das Spiel von Job dem Deutschen—Mystery Play (Kurt Eggers). **9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News. **9.40,** Light Music on Gramophone Records. **10.0,** Serenade and Dance Music by the Station Orchestra and Dance Band, conducted by Kühn. **11.0,** Gramophone Concert. Organ Fantasia on the Choral Ein' feste Burg ist unser Gott (Reger); Tenor Aria from Fidelio (Beethoven); Sicilienne from the Flute Sonata (Bach-Kempff), Second Movement from the Italian Serenade (Bach); Baritone Solos: (a) Ballad, Der Erlkönig (Schubert), (b) Romance, Flutenreicher Ebro (Schumann); Eccossaises and Bagatelle in C, Op. 33 (Beethoven); Julius Tenor Solos: Two Songs (Brahms): (a) Sonntag, (b) Meine Liebe ist grün; Symphony, No. 8, in F, Op. 93 (Beethoven). **12 Midnight** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—12.30 p.m.** (from **Dresden**), Concert of Chamber Music. **1.15,** News. **1.30,** Talk on Taxation. **2.0,** Programme for Young People. **2.35,** Market Prices. **3.0,** Concert of German Opera Music by the Leipzig Symphony Orchestra, conducted by Hilmar Weber: Overture, Alceste (Gluck); Entr'acte from Die drei Pintos (Weber); Ballet Music from Undine (Lortzing); Selection from: (a) Hansel and Gretel (Humperdinck), (b) Der Evangelimann (Kienzl), (c) The Flying Dutchman (Wagner); Intermezzo from The Jewels of the Madonna (Wolf-Ferrari); Selection from Salomé (R. Strauss). **4.30,** Reading (Velter). **5.0,** Concert by the Leipzig Chamber Orchestra, conducted by Hans Mylnarczyk: Suite from Studenten-Musik (Rosenmüller); Concerto grosso No. 8 (Corelli); Concerto grosso No. 18 (Handel). **5.40,** Economic Notes, News and Review of the Day. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** Songs to the Lute by Edmund Barczyk: Von deutscher Art; Jugendlehren; Wahre Liebe; Sehnsucht nach dem Frühling; Unter der Linde; Am Grabmal Walthers; Du bist mein; Zum Reihen. **7.30,** Symphony No. 1 (Brahms), conducted by Hans Weisbach, relayed from the Gewandhaus. **8.30,** Reading from Sinngedichte (Gottfried Keller). **9.0,** News. **9.45,** Scenes from German Life.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**6.0 p.m.,** Serbo-Croatian Lesson. **6.30,** Request Gramophone Records. **7.0,** Programme relayed from **Belgrade, 698 kc/s, 429.7 metres. 9.0,** Time, News and Dance Music.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—German Evening. **7.0 p.m.,** Gramophone Concert of Variety Music. **7.40,** Programme for Children. **7.50,** Concert of German Music by the Radio Orchestra, conducted by Henri Pensis. Concerto for Oboe and String Quintet (Händel); Overture, Beherrscher der Geister (Weber); Souvenirs de Bayreuth (Wagner-Morena); Dans une nuit d'Eté (Spies). **8.50,** News in French. **9.0,** Song Recital by Elisabeth Corty. Three Songs (Schumann): (a) Die Lotosblume. (b) Zuleikas Lied. (c) Mondnacht; Two Arias from Der Freischütz (Weber). **9.25,** Concert by the Radio Orchestra, conducted by Pensis. Overture to an Operetta (Lincke); Aubade (Caludi); Selection from The Maid of the Black Forest (Jessel). **9.45,** News in German. **9.55,** Gramophone Music. **10.20,** Dance Music by the Radio Jazz Band, conducted by Ferry Jusa.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.15 p.m.,** Announcements. **6.25,** See **Warsaw. 10.5,** Gramophone Music. **10.30** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Concert by the Pierre Lorraine Quintet: Romanian March (Volpatti); Melody (Callemien); Overture, Tancred (Rossini); Serenade from Frasquita (Lehár); Archaic Suite (Marie). **9.0,** Concert of Chamber Music by Mlle. Elaine Carrier (Songs), Morel (Bassoon), and Mme. Trottier (Pianoforte): Songs: (a) Minuet (Mozart), (b) The Butterfly (Campra); Elegy for Bassoon and Quintet (Flament); Couplets de Francinette (Chadal); Bassoon and Pianoforte Sonata (Saint-Saëns); Songs: (a) Les petits violons (Pesse), (b) Ma vieille maison grise (Messager), (c) Musette (Massenet); Hungarian Concerto for Bassoon (Webbeer); Hungarian Dance (Brahms). After the Programme, Quintet Concert (contd.). **10.40,** News.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**11.30 p.m.,** Programme relayed from **Madrid (EAJ7). 12 Midnight** till Close Down, I.B.C. Concert of Light Music: The Love Lieutenant (Gilbert); Montana Moon (Freed); Blues I love to sing (Ellington); Waltz, The Blue Danube (Strauss); Whistle and blow your Blues away (Young); Selection from Congress Dances (Heymann); A Song, a Kiss, a Girl (Gilbert). **12.30 a.m. (Friday),** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Announcements and Programme for Children. **8.15,** Topical Review. **8.30 to 9.15,** Interval. **9.15.** English Lesson. **9.30,** Chimes, Time and Topical Review. **9.45** (approx.), Dramatic Programme, Castillo de Naipes—One-Act Play in Verse (Francisco Villaespesa) and La Mascara—Radio Play in One Act (Esteban Laguna). Music in the interval. After the Programme, Dance Music. **11.45,** Topical Review. **12 Midnight,** Chimes. **1.0 a.m. (Friday)** till Close Down, I.B.C. Programme of Dance Music: Climbing up the Golden Stairs; Return of Johnnie; 13th December Stomp; On the other side of Lovers Lane; Hold me; Down in the Valley; Cuckoo on the Clock; Let's call it a Day; My Lucky Day; Ding, Dong, Ding; Tick, Tock; Isn't it Heavenly; I've found the Right Girl; Let him live; Roll up the Carpet; I've told every little Star. **2.0,** I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.30 p.m.,** German Transmission: Talk for Richard Dehmel's Seventieth Birthday, followed by Legal Talk. **6.0,** See **Prague. 9.15** till Close Down, See **Brno. 10.0** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.—10.45 a.m.,** Weather. **1.45 p.m.,** Weather. **2.0,** Concert. **3.0,** English Lesson. **3.30,** Poem for Choir and Instruments (Begritzky) followed by Sketches and Talk. **4.30,** Dramatic Programme. **5.30,** Chamber Music. **8.0,** News. **8.30,** Programme Announcements. **8.55,** Chimes from the Red Square. **9.5,** Press Review. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsberg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.** (from **Augsburg**), Concert by the Augsburg Concert Orchestra, conducted by Schmidt-Bresten. Overture, The Magic Flute (Mozart); Selection from Rigoletto (Verdi); Siegmund's Love Song from The Valkyrie (Wagner); Autumn Song (Tchaikovsky); Overture, Poet and Peasant (Suppé); Selection from Mignon (Thomas); Waltz-Intermezzo, Träume der Nacht (Schmalstich); Styrian Dances (Lanner); March (Komzak). **4.45,** Agricultural Talk: The Country Woman in the New Reich. **5.5,** Violin and Organ Recital by Heinz Lorenz and Gustav Schoedel; Allegro risolnto from the Organ Sonata in B Minor, Op. 68 (Rudinger); Variations and Choral Fugue (Frischenschlager). **5.25,** Talk on Psycho-Analysis. **5.45,** Time, Weather and Agricultural Notes. **6.0,** Transmission for all German Stations, relayed from **Breslau. 7.0,** A Garland of Song—Musical Play for Soloists, Mixed Quartet and Orchestra (Scherber). **7.50,** Famous Artists on Gramophone Records. **8.10,** Concert by the Station Orchestra, conducted by Hans Winter. Soloists: Lore Winter (Pianoforte), and Schmidt-Linder (Pianoforte). Concerto in E Flat for Two Pianofortes and Orchestra (Mozart); Suite for Chamber Orchestra, Op. (Saller). **9.20,** Time, Weather and News. **9.30,** Talk: What People are saying in America, relayed from **America.**

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jeloy LCL, 6,990 kc/s, 42.92 metres.—4.0 p.m.,** Concert by the Station Orchestra, conducted by Johannessen, relayed from **Bergen, 824 kc/s, 364 metres:** March, The Liberty Bell (Sousa); Festival Overture (Leutner); Waltz (Lanner); Ballet Music from Kassya (Delibes); Gipsy Festival (Heykens); Nocturne (Grieg); Canzonetta (Godard); In the Sunny South (Lampe); Viennese Waltz Pot-

NOV. 16th THURSDAY *continued*

pourri (Strauss). **5.0**, German Lesson. **5.30**, Divine Service, relayed from **Trondheim, 605 kc/s, 495.8 metres.** **6.0**, Announcements, Weather, and News. **6.30**, Recitations. **7.0**, Time Signal. **7.1**, Agricultural Programme. **7.30**, Coucert for the Eighty-Fifth Anniversary of the Oslo Workers' Choral Society, relayed from the University. **8.20**, Variety Programme. **8.40**, Weather and News. **9.0**, Topical Talk. **9.15**, Literary Review. **9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.**, Dopolavoro Announcements, Agricultural Notes and Giornale Radio. **7.20**, Gramophone Music. In the interval, at **7.30**, Time and Announcements. **7.45**, Concert of Operetta Music: Selection from (a) Katja the Dancer (Gilbert), and (b) Quartetto vagabondo (Pietri). **8.30**, La lettera smarrita—Comedy in One Act (Niccodemi). **9.0** (approx.), Concert (contd.): Selection from (a) La reginetta delle rose (Leoncavallo), and (b) The Bayadere (Kálmán). **10.0**, Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.**, Gramophone Record: Gipsy Chorus from Il Trovatore (Verdi); Aria from Cavalleria rusticana (Mascagni). **7.5**, Agricultural Talk. **7.15**, Journal Parlé. **7.30**, Dramatic Programme for Children. **8.0**, Talk. **8.5**, Topical Review. **8.40**, Quartet No. 5 (Beethoven). **9.20**, Gala Concert. **10.20**, News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.**, Physical Culture. **7.30**, Weather and Physical Culture (contd.). **7.45**, Gramophone Music. **8.0**, News. **12 Noon**, Protestant Address. **12.30 p.m.**, Gramophone Concert; Part I: Literary Programme; Part II: Light Music. In the interval at **1.0**, Exchange, News, and Weather, and at **1.30**, Exchange. **2.0**, The Reception to François Mauriac, relayed from the Académie Française. **3.45**, Exchange and Market Prices. **6.20**, Agricultural Talk. **6.45**, Legal Talk: Breach of Promise. **7.0**, Talk: Bonaparte in Egypt. **7.20**, Gramophone Music: Georgia Medley (Morley); Le tango du chat (Koger); Tweet Tweet (Sarony); A coup de Garcette (Lenoir); Sous les toits de Paris (Moretti); Czardas (Monti). **7.45**, Review of the German Press. **8.0**, L'Atelier d'Isabey, arranged by Gabrielle Réval. **8.30**, News and Weather. **8.40**, Review by Dominique Bonnaud. **8.45**, Dichterliebe—Song Cycle (Schumann), by Germaine Martinelli. **9.15**, News. **9.30**, Un soir quand on est seul—Monologue (Sacha Guitry).

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.**, Musical Originalities, from **New York.** **7.30**, KDKA Home Forum. **7.45**, Pioneers, KDKA to New York. **8.0**, Words and Music. **8.30**, Frances Lanford, from **New York.** **8.45**, Federation of Pennsylvania Women. **9.0**, Betty and Bob, from **New York.** **9.15**, Programme to be announced. **9.30**, News and Markets. **9.45**, Thursday Special, from **New York.** **10.0**, Federation of Women's Clubs, from **New York.** **10.15**, KDKA Kiddies' Klub. **10.30**, Singing Lady, from **New York.** **10.45**, Orphan Annie, from **New York.** **11.0**, News, Pat Haley. **11.15**, Sports and Programme Preview. **11.30**, Evensong. **11.45**, Lowell Thomas, from **New York.** **12 Midnight**, Amos 'n' Andy, from **New York.** **12.15 a.m. (Friday)**, Marvellous Melodies. **12.30**, Lois Miller, Organist. **12.45**, Pathé News of the Air. **1.0 to 3.30**, **New York** Relay. **1.0**, Captain Diamond. **1.30**, Adventures in Health. **1.45**, The Revellers. **2.0**, Death Valley Days. **2.30**, Lady Esther Serenade. **3.0**, Hands across the Border.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.**, See **Brno.** **3.50**, See **Bratislava.** **4.15**, Talk: The International Labour Conference. **4.25**, Gramophone Music. **4.35**, Elementary French Lesson. **4.50**, Gramophone Music. **5.5**, Agricultural Talk. **5.15**, Talk for Workers: The Budget and Political Economy. **5.25**, News in German. **5.30**, German Transmission—Talk on New Books and Agricultural Talk. **6.0**, Time, News, and Weather. **6.10**, Songs from Operetta—Recital by Slavka Tauberova, Hugo Kraus, and Pospisil. **6.40**, Talk: The Changing World. **7.0**, Oberon—Anonymous Opera in Three Acts, from the Early Romantic Period, with Introductory Talk. **9.0**, Time, News, and Sports Notes. **9.15**, See **Brno.** **10.0** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28**, Time Signal from Neuchâtel Observatory. **11.30**, News and Weather. **11.40** (from **Geneva**), Variety Items. **12 Noon** (from **Geneva**), Financial Notes. **12.10 p.m.** (from **Geneva**), Gramophone Concert. **1.0**, Interval. **2.58**, Time Signal from Neuchâtel Observatory. **3.0** (from **Geneva**). Concert Part I: The Radio-Suisse Romande Orchestra, conducted by Echenard. Part I: Overture, Les Saltimbanques (Ganne); Ballet Music from Les deux pigeons (Messager); Selection from Flup (Szulc); Jota Aragonaise (Saint-Saëns). Part II: Cigány Music by Robert Echnard (Violin), and the Radio-Suisse Romande Quintet. **4.30**, Dance Music on Gramophone Records. **5.0** (from **Lausanne**), Bakery Lesson. **5.30** (from **Lausanne**), Sports Talk. **5.55** (from **Lausanne**), Tourist Report. **6.5** (from **Lausanne**), Theatre Talk. **6.30** (from **Lausanne**), Agricultural Talk. **7.0** (from **Lausanne**), Violin Recital by Madeleine Gonser. **7.30** (from **Lausanne**), Songs from Sound-Films by Bruno Sarti (Tenor), and Ubaldo Russo (Baritone). **8.10** (from **Lausanne**), Popular Concert by the Small Radio Lausanne Orchestra, conducted by Moser. **9.0**, News and Weather. **9.10** (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**8.0 p.m.**, Musical Programme. **8.10**, Weather. **8.20**, Musical Programme and Announcements. **8.35**, Programme to be announced. **9.0**, Chimes and Concert by the Radio Trio. **9.30**, Reading. **10.0**, News. **10.30**, Arias on Gramophone Records, followed by Dance Music. **11.30** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres,** from **7.45 p.m.**; and **2RO, 11,810 kc/s, 25.4 metres.**—**12.5 to 1.15 p.m.**, Concert from **Turin.** In the intervals from **12.30 to 12.45**, Giornale Radio and Exchange, and at **1.0**, Time and Announcements. **3.30**, Children's Radio Review. **3.50**, Giornale Radio and Exchange. **4.0**, Talk. **4.10**, Weather. **4.15**, Concert: Tita Rosati ('Cello), Guglielmo Castello (Baritone) and Maria Biondi Briganti (Soprano); 'Cello Solos: (a) Chanson triste (Tchaikovsky), (b) La cinquantaine (Gabriel-Marie); (a) Aria from Maria di Rohan (Donizetti); Baritone Solos: (a) Aria from Sadko (Rimsky-Korsakov); Soprano Solos: (a) Aria from Mephistopheles (Boïto). (b) Serenade (Mascagni). (c) Fa la nanna, bambin (Savero); 'Cello Solos: (a) Andalouse (Granados), (b) Scherzo (Van Goens); Aria for Baritone from Don Carlos (Verdi). **5.40 (Naples)**, Shipping and Sports Notes. **5.45**, Dopolavoro, and Tourist Report. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Giornale Radio. **7.0**, Time, Announcements and Gramophone Music. **7.30**, Giornale Radio and Sports Notes. **7.45**, Programme to be announced. **9.0** (approx.), Popular Tuscan Songs for Two Voices. **9.15**, Gramophone Concert: Adagio and Allegro from the Concerto grosso in G Minor (Vivaldi); Symphonic Poem, Le chasseur maudit (Franck); Minuet (Elgar); Scherzo (Lalo); Selection from Kamarinskaya (Glinka); Entry of the Gods into Valhalla from The Rhinegold (Wagner); Overture, William Tell (Rossini). **10.0**, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

(WGY), 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.**—**12.45 a.m. (Friday)**, Stock Reports. **1.0 to 4.0, New York** Relay. **1.0**, Variety Programme. **2.0**, Captain Henry's Show Boat. **3.0**, Al Jolson; Paul Whiteman's Orchestra. **4.0**, Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **11.0** (from **Zürich**), Talk for Housewives. **11.5** (from **Zürich**), Light Orchestral Concert. **12.25 p.m.** (from **Zürich**). Time, Weather and Exchange. **12.30** (approx.) **to 2.30**, Interval. **2.30** (from **Berne**), Variety Music on Gramophone Records. **2.59**, Time Signal from Neuchâtel Observatory. **3.0**, See **Radio-Suisse Romande.** **5.0** (from **Basle**), Classical Music on Gramophone Records. **5.30** (from **Basle**), Talk. **6.0** (from **Basle**). Time, Weather and Traffic Report. **6.5** (from **Basle**), Old Dance Music on Gramophone Records. **6.30** (from **Basle**), Reading (Gottfried Keller), with Gramophone Illustrations. **7.0** (from **Basle**), Talk: Town-planning in Ancient and Modern Times. **7.30** (from **Basle**), Concert of Little Known French Songs and Pianoforte Pieces. **8.0**, Weather and News. **8.10** (from **Basle**), Concert by the Detlev Grümmer Quartet. **9.15** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**4.5 p.m.**, Divine Service, relayed from **Halmstad, 1,391 kc/s, 216 metres.** **4.30**, Programme for Children. **4.45**, Gramophone Music. **5.45**, Elementary English Lesson, relayed from **Jönköping, 1,490 kc/s, 201.3 metres.** **6.15**, Weather and News. **6.30**, Concert of Light Music by the Mässing Sextet and Bertil Bondeson (Songs): Regimental March (Bergström); Potpourri (Löfgren); Songs; Waltz, Etincelles (Waldteufel); Dance (Löfgren); March (Apitius). **7.15**, Les Fossiles—Play (François de Curel). **8.45**, Weather and News. **9.0**, Cabaret Programme. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.**, Schubert Concert of Gramophone Records. **12.45 p.m.**, News. **1.0**, Time and Exchange. **1.5**, Orchestral Concert, conducted by Roskam: Overture, Tancredi (Rossini); Song from The Gold Diggers (Dubin and Warren); Eine süsse, kleine schwarze Silhouette (Bazant); Selection from Les Saltimbanques (Ganne); You're mine, you! (Green); Slow Waltz, Lover (Rodgers); Waltz (Brahms); Foxtrot, I can't write the Words (Marks and Fields); Intermezzo, Polospiele (Fetras); One-Step, C'est la fille du moulin (Gavel). **2.0**, Programme for Children. **3.0**, Interval. **3.45**, French Elocution Lesson. **4.0**, Programme for Children, relayed from **Bordeaux Lafayette** (304 metres, 13 kW.). **6.0**, Talk in German: Woman in Modern German Novels. **6.15**, Talk for Women. **6.30**, Orchestral Concert, conducted by Maurice de Villers: Overture, Der Freischütz (Weber); Andante for Flute and Orchestra (Mozart); Orchestral Suite, A Midsummer Night's Dream (Mendelssohn); Selection from Javotte (Saint-Saëns); Fête polonaise (Chabrier). **7.30**, Time and News. **7.45**, Lottery Results, Press Review, and Announcements. **8.0**, Concert, relayed from **Vienna.** **9.0** (approx.), Press Review, Announcements, and Gramophone Music.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**11.0 a.m.**, Concert by the Station Orchestra, conducted by Gustav Görlich; Soloist, Helmut Schuhmacher (Violin): Overture, The Nuremburg Doll (Adam); Violin Concerto No. 7 (Bériot); Ballet Music (Lautenschlager); Suite, In a Fairy Realm (Ketelbey); Waltz, Künstlerleben (Joh. Strauss); March, Gruss in die Ferne (Döring). **12.15**, See **Frankfurt.** **12.25**, News. **12.35**, See **Langenberg.** **1.30**, Interval. **2.0**, Programme for Children. **3.0**, See **Frankfurt.** **5.0**, Spanish Lesson. **5.20**, Songs from Corea—Talk with Gramophone Illustrations. **5.35**, Talk: The Gold and Silversmith's Craft. **5.50**, Time and Agricultural Notes. **6.0**, Transmission for all German Stations, relayed from **Breslau.** **7.0**, See **Frankfurt.** **7.10**, See **Langenberg.** **9.0**, See **Frankfurt.** **9.20**, Things you should know. . . . **9.30**, News. **9.40** till Close Down, See **Langenberg.** **12 Midnight**, Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.**, News. **6.15**, Military Music. **6.30**, Programme for Children. **7.15**, News, Racing Results, and Market Prices. **7.30**, Pianoforte Recital: Jardins sous la pluie (Debussy); Le tombeau de Couperin (Ravel); Waltz in D Flat (Delibes); Gnomenreigen (Liszt). **7.45**, Chansonnettes. **8.0**, Operetta Music: Selection from Le grand mogol (Audran); Air from Elle est à vous (Yvain); Selection from La mascotte (Audran); Entr'acte from Brunmel (Hahn). **8.15**, Opéra-Comique Music: Arias from (a) Tosca (Puccini), (b) Mignon (Thomas), (c) Romeo and Juliet (Gounod), (a) Manon (Massenet). **8.30**, Light Music by a Viennese Orchestra. **9.0**, Concert Version of William Tell—Opera (Rossini). **9.30**, Accordion Solos. **9.45**, Orchestral Music: The Butterfly (Bendix); Extracts from Les millions d'Arlequin (Drigo); By the Sleepy Lagoon (Coates); Grasshoppers' Dance (Bucalossi). **10.0**, Light Music. **10.15**, North African News. **10.30**, Concert for Listeners in Morocco: March (Bender); Le joyeux trompette (Allier); Suite, Roma (Bizet); Overture, Richilde (Parès); Elsa's Dream from Lohengrin (Wagner); Duel Song from Faust (Gounod); Wolfram's First Song from Tannhäuser (Wagner). **11.0**, Orchestral Concert: Hurra die Musik kommt (Zimmer); Il guarany (Gomes); Nuages (Debussy). **11.15**, Dance Music. **12 Midnight**, News, Weather, and Announcements. **12.5 a.m. (Friday)**, Music by an Argentine Band. **12.15**, Light Orchestral Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.**, Gramophone Concert: Suite, Gli uccelli (Respighi); Overture 1812 (Tchaikovsky); The Garden of Eros (Franck); Scherzo (Lalo); In the Steppes of Central Asia (Borodin). **5.0 to 5.5**, Weather. **5.40**, Giornale Radio, Dopolavoro Notes and Gramophone Music. **6.0**, Time, Tourist Talk and Gramophone Music. **6.10**, Market Prices. **6.20**, News in Foreign Languages. **6.40**, Gramophone Music. **7.0**, News and Gramophone Music. **8.0**, Opera Relay. In the intervals, Talk and Literary Notes. After the Opera, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.**, Religious Information in French. **7.0 to 7.15 p.m.**, Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 552 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11 a.m.**, Concert by the Wiener Symphoniker, conducted by Josef Holzer. In an interval at **12 Noon,** Time and News. **1.0 p.m.**, Interval. **2.0**, Time and Announcements. **2.20**, Practical Hints for Housewives. **2.30**, Programme for Children. **2.55**, Operetta Music on Gramophone Records. **3.40**, Talk for Women. **4.5**, Talk: The Importance of Rabbit Breeding. **4.15**, Soprano Song Recital by Gertrude Hauk. **4.55**, Talk: The Solution of the World Economic Crisis. **5.20**, Wireless Talk. **5.45**, Theatre Notes. **5.55**, Moonlight—Concert by the Wiener Symphoniker, conducted by Josef Holzer. Soloist: Dario Medina (Tenor). In an interval at **6.35**, Time and News. **7.20**, Reading. **7.45**, Topical Talk. **8.0**, Concert of Italian Music by the Vienna Philharmonic Orchestra, conducted by Rito Selvaggi. Prelude and Allegro for Strings (Martini arr. Selvaggi); Symphony No. 2, in F (Martucci); Two Pieces (Selvaggi): (a) Scarlatti Suite, (b) Dance from Maggiolata Veneziana. Overture, William Tell (Rossini). **9.30**, News. **9.45**, Paul Whiteman and His Band on Gramophone Records, followed by Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.**, Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5**, Gramophone Music. **11.30**, Radio Journal. **11.35**, Polish Independence Day Concert. The Philharmonic Orchestra, conducted by Wolfstal, and a Choir. Soloist: Fliederbaum (Violin). Introductory Talk; Four Songs by the Choir; Overture, The Countess (Moniuszko); Violin Solos: (a) Polonaise in A (Wieniawski), (b) Couiavienne (Wieniawski); Introduction (Minheimer); Minuet (Paderewsky); Mazurka (Mlynarski); Dance from Janek (Zelenski). **1.0 p.m.**, Weather Report. **1.3**, Interval. **2.30**, Economic Notes. **2.40**, Light Orchestral Music. **3.40**, Talk. **3.55**, Soprano and Violin Recital by Kurnatowska and Zygadlo: Arias from: (a) Don Giovanni (Mozart), (b) La Sonnambula (Bellini), (c) Iolanthe (Tchaikovsky); Violin Solos: (a) Melody (Paderewsky), (b) Romance (Szymanowski); Soprano Solos: (a) Sonntag (Brahms), (b) Ici (Cui). (c) The Swallow (Crescenzo), (d) Song (Wielhorski); Violin Solos: (a) Prayer (Handel-Flech), (b) Slav Dance in E Minor (Dvorák-Kreisler), (c) Perpetuum mobile (Novacek). **4.50**, Rural Programme for Young People. **5.0**, Talk. **5.20**, Extracts from Pygmalion—Play (Bernard Shaw). **6.5**, Miscellaneous Items. **6.25**, Topical Talk. **6.40**, Programme Announcements. **6.45**, Radio Journal. **7.0**, Witolerauda—Lyric Suite (Moniuszko), by the Harfa Choir, conducted by Lachman. Soloists: Lipowska (Soprano), Mossoczy (Bass) and Sliwicki (Recitations). **8.0**, Answers to Correspondence. **8.15**, Light Music by the Station Orchestra, conducted by Nawrot. Soloist: Olga Kamienska (Songs). Overture, Silverin (Silvery); Three Songs; Waltz, Radner Madln (Komzak); Three Songs; Tarantella, Capodimente (Solazzi); Mazurka, Batory (Namyslowski). **9.0**, Sports Notes. **9.10**, Dance Music from the Adria Café. In an interval at **10.0**, Aviation Weather Report and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

FRIDAY

NOVEMBER THE SEVENTEENTH

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.**—**1.30 to 2.30 p.m.,** Time, Weather, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Talk on Gardening. **7.15,** Literary and Dramatic Criticisms. **7.30,** Time. **7.31,** Concert by the Station Orchestra. Soloist: Ernest Hargreaves (Tenor). **8.35,** 'Cello Solos by Aileen Foley. **8.50,** A Revue presented by Eva Brennan and Company. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert of Dance Music: I've got to sing a Torch Song; Jealousy; Dancing Butterfly; The Shadow Waltz; Smoke Rings; Under a Blanket of Blue; Don't be late in the Morning; Reflections in the Water. **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Selection from The Desert Song (Romberg); Spanish Gipsy Dance (Marquina); Waltz from Der Rosenkavalier (R. Strauss); Black Eyes (Ferraris); Amorettentänze (Gungl); Banjo Solo: Rugby Parade March (Oakley); Over the Waves (Rosas). **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** Songs and Stories by Fay Sargent. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW. **6.0 p.m.,** Trio Concert: Ich liebe dich (Grieg); Ochsen (Haydn); Selection from Ariane (Massenet); Intermezzo (Lindsay-Theimer); Nocturne (Percy); Ständchen (Schubert); Selection from The Prophet (Meyerbeer). **7.0,** Request Gramophone Records. **7.30,** Exchange and Gramophone Records (contd.). **8.0,** Gramophone Music. **8.30,** Educational Programme: Geography and History Lesson. **9.0,** Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. **9.10,** Concert of Light Music by the Radio Orchestra; March (Vieth); Selection from Alma de Dios (Serrano); Moonlight on the Alster (Fétras); Her First Dance (Heykens); Selection from Le petit choc (Szulc); Intermezzo (de Micheli); Dance, Cloe (Rodriguez Rosés). **10.15,** Violin and Pianoforte Recital. **10.40,** Dance Music, relayed from the Casa Llibre. In the interval at **11.0,** News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 to 3.55 p.m.,** Gramophone Music. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15,** See **Turin. 7.30** (approx.), till Close Down., See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW. **11.0 a.m.,** Weather. **11.5,** Gramophone Concert. After the Concert, Weather. **11.55,** Time. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Gramophone Concert. **2.0,** Dialogue: Sports and the German Girl. **2.30,** Weather and Exchange. **2.45,** Reading. **3.0,** See **Leipzig. 4.0,** Talk: The Education of Teachers. **4.25,** String Quartet in G (Mozart), by the Berber Quartet. **5.0,** Poems. **5.5,** Talk. **5.25,** German for Germans. **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations: Spohr Concert by the Chamber Music Society of the Berlin Opera House, conducted by Georg Kniestädt: Duet for Two Violins, Op. 3; Duet for Two Violins, Op. 67; Grand Nonetto. **7.0,** To-day's Motto. **7.10,** See **Frankfurt. 9.0,** News and Sports Notes. **9.45,** Weather. **10.0,** Radio Report of the Six Days' Racing in the Sportpalast. **10.10,** Concert relayed from **Leipzig.**

BERLIN

FUNKSTUNDE; 716 kc/s, 419 metres; 1.5 kW. Relayed from **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.**—**3.35 p.m.,** Organ Recital by Erwin Christoph, relayed from the Ufa-Palast: In der Dämmerung (Ebel); Schlittenfahrt (Ebel); Gavotte (Gossec); Selection from Tosca (Puccini); Selection from Ihre Durchlaucht, die Verkäuferin (Benatzky). **3.55,** Concert by Dolly Lorenz (Soprano), Ursula Noack (Harp), Alexander Eckleben and Georg Vack (Pianoforte Duets). **4.30,** Reading: Youthful Pranks. **5.0,** A Short Cabaret, on Gramophone Records. **5.30,** The Funkstunde informs its Listeners . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.5,** Concert by the Station Orchestra, conducted by Dr. Hans Hörner: Prelude to Cantata No. 29 (Bach-Hörner); Symphony in D (Mozart); Concert Piece, Op. 86, for Four French Horns and Orchestra (Schumann-Hörner). **8.0,** Topical Programme. **8.20,** Wisdom in Wit—Humorous Programme. **9.0,** News and Sports Notes. **9.20** (approx.), See **Hamburg.** In the interval at **10.0** (approx.), Topical Talk. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.3 metres; 14 kW.—**6.0 p.m.,** See **Prague. 6.10,** Talk on the Island of Capri. **6.25,** See **Brno. 7.0,** Introductory Talk to the following Transmission. **7.5,** Symphony Concert, relayed from the Slovak National Theatre. The Bratislava Symphony Orchestra, conducted by Karel Nedbal. Soloist: Prof. Kubat (Violin); Symphonic Poem (Schneider-Trnavsky); Burlesque for Violin and Orchestra (Suchon); Concertino for Orchestra (Moyzes); Symphony, No. 8, in F, Op. 93 (Beethoven). **9.0,** See **Prague. 9.30** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**12.45 p.m.,** Time and News. **1.10,** Gramophone Concert. **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.30,** Programme for Children. **3.0,** Concert by the Station Orchestra, conducted by Gerhard Rischka. In the interval at **3.45,** Reading (Gottfried Keller). **5.0,** Talk: The German Peoples and Art. **5.20,** Talk: The Silesian and his Language. **5.40,** Programme Announcements and Meat Market Prices. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** News. **7.10,** Concert of Opera Music: The Silesian Philharmonic Orchestra, conducted by Ernst Topitz and Soloists: Herma Kaltner (Soprano), Lisa Elm (Contralto), Jost Berkmann (Tenor), and Heinrich Pflanzl (Bass). Overture, The Merry Wives of Windsor (Nicolai); Romance, Knowest thou the Land from Mignon (Thomas); Song, Auch ich war ein Jüngling from Der Waffenschmied (Lortzing); Intermezzo from Cavalleria rusticana (Mascagni); Song, O schöne Jugendtage from Der Evangelimann (Kienzl); Aria from Martha (Flotow); Duet from Il Seraglio (Mozart); Quartet from Rigoletto (Verdi); Overture, The Bartered Bride (Smetana); Aria from Der Freischütz (Weber); Aria from Don Giovanni (Mozart); Trio from Il Trovatore (Verdi); Drinking song from The Merry Wives of Windsor (Nicolai); Drinking Song from Cavalleria rusticana (Mascagni); Duet from Madame Butterfly (Puccini); Lohengrin's Narrative and Introduction to the Third Act from Lohengrin (Wagner). In the interval at **8.0** (approx.), Radio Report from the Rothenbach Mining District. **9.0,** Time and News. **9.30,** Concert, relayed from the Vaterland Café. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News, Sports Notes, Topical Talk and Talk on Hygiene. **6.0,** See **Prague. 6.25,** A Brass Band Concert. **7.0,** Choral Concert. **7.35,** Chopin Pianoforte Recital by Marie Dvorakova. Nocturne in C Minor, Op. 13; Ballad in F; Impromptu in A Flat; Scherzo in B Minor. **8.0,** See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—**12 Noon,** Dreams Gramophone Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans. **5.0,** Concert by the Radio Orchestra, conducted by Franz André. **6.0,** Talk: A School for the Deaf and Dumb and the Blind. **6.15,** Gramophone Records. **7.0,** Duet Recital by Daisy Gilbert and Germaine Jacobs. **7.15,** Talk: Conçisin and the Younger Generation. **7.30,** Legal Talk, followed by Literary Review. **8.0,** Concert by the Symphony Orchestra, conducted by Kumps. Soloists: Toubeau René (Baritone) and Delcour (Pianoforte). Viennese Rhapsody (Schmitt); Songs: (a) Aria from La Traviata (Verdi), (b) Lolita (Buzzi-Peccia), (c) A une mère (Boisdeffre); Dance of the Sylphs and Dance of the Will-o'-the-Wisps, from The Damnation of Faust (Berlioz); Trio for Trumpet, Horn and Trombone (Poulenc); Selection from Namouna (Lalo). **8.45,** Talk: The Slump and the Provincial Budget of Brabant. **9.0,** Concert (contd.): Scene and Waltz from Gretna Green (Guirand); Berceuse (Vreuls); Humoresque (Vreuls); Slav Dance (Chabrier); Pianoforte Solos: (a) Jeux d'eaux (Ravel), (b) Mouvement perpétuel (Poulenc), (c) Phalène (Philipp), (d) Juca follets (Philipp); Belgian Folklore Sketches (Clymans); Ballet Suite (Gilson). **10.0,** Le Journal Parlé. **10.10,** La Brabançonne.

BRUSSELS (No. 2)

N.I.R.; 888 kc/s, 337.8 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Die schöne Galathée (Suppé); Waltz (Vollstedt); Serenade for Flute and 'Cello (Titl); Offenbach Potpourri (Conradi); Violin Solo: Guitar (Moszkowsky-Sarasate); Ballet égyptien (Luigini); Humoresque (de Taeye); Tarantella (Caludi). **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Music. **5.0,** Music by the Symphony Orchestra, conducted by Kumps: Divertissement (Kumps); Suite (Kalkman); Ballet Music from Faust (Gounod). **6.0,** Gramophone Records: Danse des elfes (Popper); Gipsy Suite (German); Moon Song (Johnston); Gebirgsweisen; Selection from Music in the Air (Kern). **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Juro (Guillemyn); Melody (Rachmaninov); Ballet Music from Isoline (Messager); Arabesques (Debussy); Minuet and Tocatelle (d'Angrèves); Bacchanale (Liadov); Lament (Liadov); Gopak (Mussorgsky). **7.15,** Talk on Economies. **7.30,** Radio News. **8.0,** Concert by the Radio Orchestra, conducted by Franz André. Part I, Viennese Music. Overture, The Gipsy Baron (Joh. Strauss); Four Viennese Pièces (Kriesler); Waltz, The Blue Danube (Joh. Strauss); Perpetuum Mobile (Joh. Strauss). **8.50,** R.C.R.—Play (Karel Capek), translated by De Muynck. **9.30,** Concert (contd.). Part II, Spanish Music. Suite, España (Albeniz); Spanish Dance (Sarasate); Selection from Juegos (Turina); Dances (Granados). **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Dance Music by the Visoin Jazz Band. In an interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Missa solemnis in D (Beethoven), by the Philharmonic Orchestra, conducted by Georgescu, relayed from the Athenaeum **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **6.10 p.m.** till Close Down. **4.40 p.m.,** Tolstoi speaks—Talk with Gramophone Records of Tolstoi's Voice. **5.0,** Talk on Budapest. **6.10,** Review of Foreign Affairs. **6.30,** Relay from the Royal Opera House. In the Intervals, News. After the Relay, Dance Music by the Pataky Band, relayed from the St. Gellert Hotel.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres.**—**11.0 a.m.,** Time and Chimes from the Town Hall. **11.5,** String Ensemble Concert, relayed from the Hotel d'Angleterre. **1.0,** Interval. **2.0,** Concert by Carl Rydahl's Instrumental Ensemble: Soloist: Ellen Gilberg (Pianoforte): Overture, Berlin wie es weint und lacht (Conradi); Waltz (Ivanovici); Romance (Debussy); Selection from Alceste (Gluck); Waltz (Brahms); Extract from Maskarade (Nielsen); Pianoforte Solos (Chopin): (a) Mazurka in B Minor, Op. 33, No. 4, (b) Etude in A Flat, Op. 25, No. 1, (c) Etude in E, Op. 10, No. 3, (d) Etude in C Minor, Op. 10, No. 12, (e) Nocturne in E Flat, Op. 9, No. 2; Prelude (Svendsen); Waltz, Moonlight on the Alster (Fetras); Selection from The Little Mermaid (Henriques); Barcarolle (de Taeye); Spring Song (Mendelssohn); Serenade (Rachmaninov); Overture, Casanova (Lincke). **4.0,** Reading. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: Religious Problems in Copenhagen To-day. **5.15,** German Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time. **6.16,** Radio Report on the International Tennis Championship—Denmark v. Sweden. **6.50,** Recitations. **7.0,** Concert of Sacred Music by the Copenhagen Boys' and Male Voice Choir, conducted by Mogens Wöldike: Soloists: Finn Viderö (Harpsichord), Aksel Schiotz (Tenor), and Andersen (Bass): Agnus Dei from Tu es Petrus (Palestrina): Crucifixus (Lotti): Motet (Corsi): Harpsichord Solos: (a) Fugue in A Minor (Scarlatti), (b) Toccata (Leo); Cantata (Krieger); Harpsichord Solo: Toccata and Fugue (Krieger); Evensong (Ahle). **7.45,** Little Man, What Now?—Radio Play, after the Novel by Hans Fallada (Claus Hermann). Danish Translation by Otto Rung. **9.15,** News. **9.30,** Mandoline Concert: Serenade (Graziani-Walter); Waltz, Rose monsse (Bosc); Serenade from Les Millions d'Arlequin (Drigo); Pizzicato Polka (Delibes); Si vous l'aviez compris (Denza); Spanish Waltz, La Serenata (Metra); Mazurka, La Czarine (Gamne). **10.0,** Dance Music, relayed from the Ritz Restaurant. **11.0,** Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. Happy Hour. Part I: Orchestral Music. Signature Tune; March from Sylvia (Delibes); Ballet from the Petite Suite (Debussy); Violin Solo: Souvenir (Drdla); Humoresque (Dvorák); Salut d'amour (Elgar); Entrance of the little Fauns (Pierné); Violin Solo: Tambourin Chinois (Kreisler); Ballet égyptien (Luigini). Part II: Dance Music. There's a Cabin in the Pines; Sing another Line; Happy ending; Let's make up; Trouble in Paradise; Adios, Goodbye; Ding, Dong, Ding; Egypt; Signature Tune. **12 Noon,** French Programme. **4.30 to 6.0 p.m.,** Programme in English by the I.B.C. **4.30,** I.B.C. Nursery Corner with Columbus and Belinda; Birthday Greeting; Trumpets. **4.40,** Southampton and Winchester Concert. I.B.C. Members' Request Hour. Signature Tune: The Night by the Sea; Overture, Poet and Peasant (Suppé); Barcarolle from The Tales of Hoffmann (Offenbach); You are my Heart's Delight (Lehár); One Fine Day, from Madame Butterfly (Puccini); Lily of Lagnna (Stuart); Intermezzo from Cavalleria rusticana (Mascagni); Love's Dream after the Ball (Czibulka); Daisy Bell (Dacre); Smilin' through (Penn). **5.20,** Bournemouth and Weymouth Concert of Gramophone Records: Medley of Regimental Marches; My Darling (Heymann); Really Blue (Venuti); There's a Cabin in the Pines (Hill); Just an Echo in the Valley (Woods); Fairy Tale (Heykens); Joanna (Rhys); Down in the Valley (Harrington); Blaydon Races (Traditional); The Birth of the Blues (Henderson); Rakoczy March (Berlioz); Signature Tune. **6.0,** French Programme. **10.0** (approx.) till Close Down. Programme in English by the I.B.C. **10.0,** Dance Music: Signature Tune: Bells of Normandy; Moths around the Candle Flame; Dawn in Montmartre; Shadows on the Swanee; Goodnight little Girl of my Dreams; Cecilia Mia; The Last round up; Snowball; Whistling under the Moon; Mary Rose; Isn't it Heavenly; Lazybones; Sundown in a little Green Hollow; Mi Amor esta en el Valle; Oh! Johanna; Trouble in Paradise; Forever; Signature Tune. **11.0,** Talkie Time—Tunes from the Talkies and Shows. Signature Tune: Sittin' in the Dark; Learn to Croon; Love Songs of the Nile; A Girl like Nina; There's Magic in the Air; Selection from The Chocolate Soldier; Waltz Time Medley; Heaven will protect an Honest Girl; Selection from Il est charmant; Signature Tune. **11.30,** Club Concert for Cambridge Listeners. Part I: Orchestral Music. Signature Tune: The Chun Song; Dance of the Sylphs (Berlioz); The Witches' Ride (Humperdinck); 'Cello Solo: The Nightingale and the Rose (Rimsky-Korsakov); Waltz in D (Glazunov); The Enchanted Forest (Gangberger); Violin Solo: Le Cygne (Saint-Saëns); Prelude to Carmen (Bizet); Prelude and Mazurka from Coppélia (Delibes). **12.5 a.m. (Saturday),** I.B.C. Late News Bulletin. **12.10** (approx.), Club Concert. Part II: Light Music. Happy as the Day is Long; Waltz, Wood Violets; Adorable; Tick, Tock; Learn to Croon; Signature Tune. **12.30,** Dance Music: Seven Years with the Wrong Woman; I've found the Right Girl; Don't blame me; My Moonlight Madonna; Louisville Lady; Come out, Vienna; The Wedding of Mr. Mickey Mouse; Nunca. **1.0,** Dance Music: Signature Tune: The Bells of Normandy; Dinner at Eight; Dancing Butterfly; Its the Talk of the Town; My Own; Sweet Dreams, Pretty Lady; P.C. 123; Avalon; Aloha Oe!; Sing another Line; Blue Cloud; Cornflowers and Poppies; Hold me; It's not a Secret any more; My Kingdom for a Smile from you; Morning, Noon and Night; Ding, Dong, Ding; Signature Tune. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1.157 kc/s, 259.3 metres.**—**12.15 p.m.,** Time and News. **12.25,** News and Weather. **12.35,** See **Langenberg. 1.40,** Programme for the Housewife. **2.30,** Weather. **2.40,** Time and Economic Notes. **3.0,** See **Langenberg. 5.35,** Talk. **5.50,** Weather, News and Programme Announcements. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** Topical Talk. **7.10.** Künneke Concert, conducted by the Composer. The Station Orchestra and Choir and Soloists: Margarete Teschemacher (Soprano) and Karl Pistorius (Tenor). Romantic Overture, Extracts from Little Dorrit; Tango and Duet from Fahrt in die Jugend; Prelude to Lady Hamilton; Song from the Film Es gibt nur eine Liebe; Tango from the Film, Heimkehr ist Glück; Huntsman's Overture; Selection from Liesel; Entr'acte from Glückliche Reise; Selection from Die verliebte Paulette; Extracts from Lady Hamilton; Finale from the Suite Das Blumenwunder. **9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** News and Weather. **9.40,** See **Langenberg. 11.0,** Talk: The Laws of Friendship. **11.45** (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

NOV. 17th **FRIDAY** *continued*

HAMBURG

Call ha (in Morse), 806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—5.0 p.m.,** Variety Programme, relayed from the Radio Exhibition. **5.20,** Book Review. **5.40,** Frankfurt Exchange and Hamburg Market Prices. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** Hokuspokus—Play in Three Acts (Goetz). **8.30** (from **Bremen**), Pianoforte Recital by Gertrud Fischer. Rhapsody (Liszt); Ecossaises (Beethoven-Busoni); Waltz (Carreno); Military March (Schubert-Tausig). **9.0,** Time and News. **9.20** (from **Hanover**), Concert by the Hanover Symphony Orchestra of Unemployed Musicians, conducted by Otto Ebel v. Sosen. Overture, Der Hahn im Korb (Rieger); 'Cello Solo: Lullaby (Simon); Ballet Suite (Drigo); Saxophone Solo: Valse Mazanetta (Wiedoeft); Serenade for Strings and Pianoforte, Sehnsucht (Nüsse); Bassoon Solo: Mister Brumm, der Nebenbuhler (Ganglberger); Foxtrot, Bumerang (Kool); Die Spieldose (Manfred); Waltz, Lustige Brüder (Vollstedt); Im Automatensalon (Vollstedt); Bassoon Solo: Der alte Brummbär; Intermezzo, Katze und Maus (Englemann); March, Wir drehen ihm eine Nase (Millöcker); Gallop, Letzte Runde (Bernards).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert: Wem Gott will rechte Gunst erweisen (Mendelssohn); East Prussian Peasant Dance (Schulze-Stolle); Durchs Brandenburger Tor (Althoff); Lincke Potpourri; Silesian Folk Song, Kehr ich einst in meine Heimat; In Hamburg an der Elbe (Krome); Moonlight on the Alster (Fetras); Hamburger Lied (Schraub); Schleswig-Holstein (Bellmann); Two Swabian Songs: (a) 's Zuschaun (Bohm), (b) Im Köpfle zwei Augle (Millöcker); Mit Willi Ostermann am Rhein; March (Scharf); Bavarian Folk Dances (Pollak); Wenn in Heidelberg wieder die Rosen blühn (Grothey); Schwarzwälder Spieluhr (Richter); Ewig liebe Heimat (Breu). In the intervals at **12.20 and 1.0,** News. **1.30,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices and Exchange. **2.15,** Programme for Children. **2.30,** Two Talks for Women. **3.0,** Concert relayed from **Leipzig. 4.30,** Book Review. **4.45,** Talk: The Work of Peasant Girls on the Farm. **5.15,** Agricultural Prices. **5.25** (from **Danzig**), Soprano Song Recital by Lea Piltti: Songs (Reger): (a) Mariä Wiegenlied, (b) Zum Schlafen, (c) Herzenstausch; Meinem Kinde (R. Strauss); Wiegenlied (Wolf); Guten Abend, gute Nacht (Brahms); Ach, wer das doch könnte (Berger). **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** News. **7.15,** in the Bremen Ratskeller—Radio Play about German Wine (Hauff Kuhnert). **8.10,** Symphony in C Sharp Minor (Pfitzner), relayed from the Stadthalle, Königsberg. The Königsberg Opera House Orchestra, conducted by Erich Seidler. **9.0,** News and Sports Report. **9.20,** Modern German Dance Music.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.—11.40 a.m. to 3.40 p.m.,** Programme of the General Broadcasting Society (A.V.R.O.). **11.40,** Time Signal. **11.41,** Gramophone Music. **12.10 p.m.,** Concert by Kovacs Lajos and his Orchestra. In the interval, Gramophone Music. **2.10,** Fashion Talk. **2.40,** Gramophone Music. **3.10,** Concert by Cornelius Codolban and his Orchestra. **3.40 to 7.40,** Programme of the Workers' Radio Society (V.A.R.A.). **3.40,** Gramophone Music. **4.30,** Programme for Young People. **5.10,** Concert by the Small V.A.R.A. Orchestra, conducted by de Groot: Un jour (Nobel); Comedy Overture (Lincke); Lustige Brüder (Vollstedt); Tre Blume (Oscheit); Die Wut über den verloren Groschen (Beethoven); Potpourri, Im Rosengarten Mendelssohns (Urbach). **5.55,** Orchestral Concert: Hand in Hand (Blon); Verschmähte Liebe (Lincke); Parade der Backfischen (Lincke); Donna Vatra (Köpping); Songe d'automne (Massenet); Tango (Bréones); Une larme (Mussorgsky); Schwarze Zigeuner (Vaeck); Gramophone Records; Quand l'amour meurt (Crémieux); Conchita (Staub); Un peu d'amour (Silesu); Rio Rita (Santeugini). **6.50,** Talk on Fascism. **7.10,** Concert by De Fliereffluiters, Soloist: de Booy (Songs). Kamerad wir sind die Jugend (Stolz); Pettin' in the Park (Warren); Ein Tag möcht' ich bei dir sein (Abraham); Jodellied (Steiniger-Hayfisch); I've got to sing a Torch Song; Lazybones; Nur dir will ich gehören (Niederberger); Schöne Isabella von Castilien (Bootz). **7.40 to 10.40,** Programme of the Liberal Protestant Radio Society (V.P.R.O.). **7.40,** Religious Lesson. **8.10,** Gramophone Records. **8.40,** Talk. **9.10,** Gramophone Records. **9.40,** Religious Information. **9.45,** News. **9.55,** Talk on Shakespeare's Tragedy, King Lear. **10.25,** Gramophone Records **10.40** till Close Down, V.A.R.A. Programme. **10.40,** Organ Recital by Jong: Overture, Semiramis (Rossini); Serenade (Drigo); The Nigger's Dream (Myddleton); An Old Violin (Fischer); Hello, Chérie; Let's put out the Lights. **11.10,** Gramophone Records. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.** Programme of the Catholic Radio Society (K.R.O.).—**11.40 a.m.,** Police Notes. **11.55,** Concert by the K.R.O. Sextet, conducted by Lustenhouwer: The North Star (Grit); Roses of Picardy (Chapelier); The Skaters' Waltz (Waldteufel); Prelude (Rahm); Oriental Suite (Popy); Amon (Guillaume); Gramophone Records; Overture to a Revue (Lincke); Waltz, Transaktionen (Strauss); Minuet (Boccherini); Finale. **1.40,** Gramophone Records. **2.40,** Recital of Breton Folk Songs. **3.40,** Interval. **3.55,** Gramophone Music. **4.10,** Concert by the K.R.O. Boys, conducted by Lustenhouwer. In the interval at **4.40,** Horticultural Talk. **5.40,** Talk on Austria. **5.55,** Gramophone Music. **6.40,** Police Notes. **6.55,** Talk on Aviation. **7.15,** Gramophone Music. **7.40,** Concert by the K.R.O. Orchestra, conducted by Lustenhouwer; Soloist, Myra Hess (Pianoforte): Brandenburg Concerto No. 5 in D (Bach); Two Minuets (Mozart); Pianoforte Concerto in A minor (Schumann). In the interval at **8.10,** News. **8.40,** Gramophone Music. **8.55,** Talk. **9.10,** Pianoforte Recital by Myra Hess. **9.25,** Gramophone Music. **9.30,** Concert by the K.R.O. Orchestra, conducted by Gerritsen: Overture, Nell Gwynn (German); Three Woodland Dances (Haines); The Enchanted Lake (Liadov); Country Dance (Liadov); Two Slav Dances (Dvorák). **10.10,** News. **10.15,** Gramophone Music. **10.25,** Concert by the K.R.O. Boys, conducted by Lustenhouwer: Mir ist so ich weisz nicht wie (Heymann); Ke-sa-ko (Chapunis); Russian Overture (Nussbaum); Nachtigall in Fliederbusch (Krome); Man trägt wieder treue Augen (Suppé-Grosz); Le cygne (Saint-Saëns); March on Themes of Johann Stranss (Pretsch); Hungarian Medley (Somers); Berceuse (Schubert); Play, fiddle, play (Deutsch); Kinderherzen (Kockert); The Song is ended. In the interval at **10.55,** Gramophone Music. **11.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results and News. **8.10,** Esperanto Lesson. **8.25,** Radio Concert. In the interval at **9.0,** News and Weather.

KALUNDBORG.—See **Copenhagen.**

KEIL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.35 p.m.,** Concert by the Fröhliche Fünf and Soloists. **1.30,** Gramophone Records. **2.30,** Market Prices. **2.50,** Political Announcements. **3.0,** Concert. The Station Orchestra, conducted by Otto Julius Kühn, the Station String Quartet, and the Station Choir, conducted by Josef Breuer, and Soloists: Kläre Hansen (Soprano) and Hans Haass (Pianoforte). Festival March (Joh. Strauss); Rhapsody on Swedish Folk Melodies (Lindberg); Soprano Solos (Richard Strauss): (a) Freundliche Vision, (b) Stündchen; Carnival Waltz (Kienzl); The Swan of Tuonela (Sibelius); Five Choral Songs (Krug): (a) Im Haselstrauch, (b) Elslein, (c) Sonnenwende, (d) Liebesahnung, (e) Frau Sonne; Romance and Scherzo for String Quartet (Grieg). **5.0,** English Conversation. **5.20,** Talk. **5.35,** Silcher Song Recital by the Station Choir, conducted by Breuer: In der Ferne; Lebewohl; Die drei Röselein; In einem kühlen Grunde; Wohin mit der Freud. **5.50,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0 to 9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News and Sports Report. **9.40,** Gramophone Records. **10.0,** Music by the Station Orchestra and Dance Band. **11.0,** See **Frankfurt. 12 Midnight,** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—12.15 p.m.,** News and Programme Announcements. **12.30,** Concert by the Leipzig Instrumental Quartet: First Movement from the Trio in B flat, Op. 63, No. 2 (Sitt); Duet for Violin and 'Cello (Beethoven); Adagio for 'Cello and Pianoforte (Haydn); Leichte Solostücke in E, Op. 41, No. 2, for Violin and Pianoforte (Leonhard); Melodie and Albumblatt for Viola and Pianoforte (Reger); Kleines Quartett im leichteren Stile, Op. 272 (Reinecke). **1.30,** News and Art Review. **1.45,** Programme for Women. **2.0** (from **Dresden**), Recital by Gertrud Seydewitz (Songs) and Leny Rudolph (Pianoforte): Pianoforte Solos (Brahms): (a) Intermezzo, Op. 119, No. 3 (b) Rhapsody, Op. 79, No. 2. Songs: (a) An die Musik (Schubert), (b) Der Nussbaum (Schumann); Berceuse for Pianoforte, Op. 57 (Chopin); Two Songs (Brahms): (a) Sappische Ode, (b) Unbewegte laue Luft; Waltz in A flat for Pianoforte, Op. 39 (Brahms). **2.35,** Market Prices. **3.0,** Concert by the Station Orchestra, conducted by Blumer. Soloists: Max Krämer (Violin): Overture, King Manfred (Reinecke); Concert Piece in D for Violin and Orchestra (Schubert); A Pastorale in Three Scenes, Op. 50 (Palmgren); Capriccio, Op. 42, for Violin and Small Orchestra (Blumer); Hungarian Dances Nos. 5 and 6 (Brahms); Perpetuum mobile from the Suite No. 3, Op 34, No. 5 (Ries); Waltz, Bei uns zu Haus (Joh. Strauss); Waltz, Die Schönbrunner (Lanner); Gilda Walzer (Millöcker). **4.30,** The Provincial Lottery of Saxony. **4.40,** Review of Books. **5.5,** Music from Recent Sound Films (on Gramophone Records). **5.15,** Books for the Hitler Jugend. **5.40,** Market Prices, News and Review of the Day. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** Gen Ostland woll'n wir reiten—Radio Play (Schwarz). **8.0,** Concert by the Dresden Mandoline Quintet and Fred Rüffer (Zither): Fantasie brillant (Ludwig); Hulrigung (Freytag); Minuet (Mozart); Neapolitan Serenade (Scarano); Scherzo (Marucelli); Four Pieces (Munier); Waltz (Mozart); Moment musical (Schubert); Children's Dance (Pizzi); Hungarian Fantasia (Maciocchi). **9.0,** News and Sports Notes. **9.30,** Talk: German Achievements in Chemical Research. **10.0,** Concert by the Emdé Orchestra. **11.30** (approx.), Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW. Dutch Evening.—**7.0 p.m.,** Symphony No. 4 (Tchaikovsky), by the Concertgebouw Orchestra, Amsterdam, conducted by Mengelberg (on Gramophone Records). **7.40,** Song Recital by Alice Peffer: Two Songs (Schumann): (a) Ich kann's nicht fassen, (b) Ich grolle nicht; Berceuse (Fischer Lamarque); L'invitation au voyage (Duparc); Die junge Nonne (Schubert). **8.0,** Concert by the Radio Orchestra, conducted by Henri Pensis: Slav March (Tchaikovsky); Berceuse (Godard); Calme (Honegger); Suite Orientale (Popy); Torch Dance of the Brides of Cashmir (Rubinstein); Scènes nuptiales (Smetana); Scènes pittoresques (Massenet); Hungarian Dances Nos. 5 and 6 (Brahms); Melody (Königsberger); Selection from Countess Maritza (Kálmán); March (Westenberg). In an interval at **8.50,** News in French. **9.50,** News in German. **10.0,** Concert by the Radio Orchestra, conducted by Henri Pensis; Poppy (Moret); Simple aveu (Thomé); March lorraine (Ganne). **10.15,** Dance Music on Gramophone Records.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Eva—Operetta in Three Acts (Lehár), relayed from **Rennes.** After the Relay, News.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12.0 Midnight** till Close Down, I.B.C. Concert of Light Music: I may be wrong but I think you're wonderful; The Song of the Isles (King); I love you (Canaro); Bidin' my Time (Gershwin); Selection from The Vagabond King (Friml); Arrogancia Andaluzza (Bruguera); Black-eyed Susan Brown (Hoffmann); Hawaiian Sweetheart of Mine (Heagney). **12.30 a.m. (Saturday),** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Announcements and Programme for Women. After the Programme, Dance Music. **8.15,** Topical Review. **8.30 to 9.30,** Interval. **9.30,** Chimes, Time and Topical Review. **9.45** (approx.), Extracts from Opera on Gramophone Records: (a) L'Heure Espagnole (Ravel), (b) Don Pasquale (Donizetti). **11.45,** Topical Review and Programme Announcements for Listeners Abroad. **12.0 Midnight,** Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Plichta: Fantasie on Themes of Dvorák, from The Old and New World (Leopold); Polka (Smetana); Selection from Javotte (Saint-Saëns); Egyptian Dance (Friml); Moravian Dance (Janacek). **3.55,** Talk: Winter Sports. **4.5,** See **Prague. 5.5,** Tourist Talk. **5.15,** See **Prague. 6.25,** See **Brno. 7.0,** Report from the Public Library. **7.25,** Dance Music by the Station Orchestra, conducted by Musil. **8.0,** See **Prague. 8.15,** Concert of Light Music by the Station Orchestra, conducted by Musil. **9.0** till Close Down, See **Prague. 9.30** (approx.), Close Down.

MOSCOW

TRADES UNION, 230 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.—10.45 a.m.,** Weather. **1.45 p.m.,** Weather. **2.0,** Gramophone Records of Russian Music followed by Vocal Quartet Music. **3.30,** Talk on Soviet Literature. **4.30,** Concert of Music by Sibelius, Svendsen, and Grieg. **5.30,** Concert of Operetta Music. **8.0,** News. **8.30,** Programme Announcements. **8.55,** Chimes from the Red Square. **9.5,** Press Review. **10.0,** Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.,** Orchestral Concert, conducted by Erich Kloss: Overture, Armida (Gluck); Ballet Music from Undine (Lortzing); Extract from Hanneles Himmelfahrt (Graener); Waltz, Traum-Ideale (Fucik); Selection from Mam'zelle Nitouche (Hervé); 'Cello Solo: Cantabile (Cui); Gavotte (Schütt); March, All Deutschland, gross und frei (Rudolf). **4.45,** Talk: The Position of the German Girl To-day. **5.5,** Soprano Song Recital by Thea Böhm-Linhard. **5.25,** Legal Talk. **5.45,** Time, Weather and Agricultural Report. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deuschlandsender). 7.0,** Political Announcements. **7.10,** See **Frankfurt. 9.0,** Time and News.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredricksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jeløy LCL, 6,990 kc/s, 42.92 metres.—4.0 p.m.,** Concert by the Minsaas Orchestra, relayed from **Trondheim, 605 kc/s, 495.8 metres:** Waltz, Gold and Silver (Lehár); Schwärmerei (Arlberg); Selection from La Traviata (Verdi-Tavan); Berceuse de Jocelyn (Godard); Ballet Music from La Gioconda (Ponchielli); Hungarian Dance No. 5 (Brahms); Tango (Folke). **5.0,** French Lesson. **5.30,** Talk. **6.0,** Announcements, Weather and News. **7.0,** Time Signal. **7.1,** Symphony Concert by the Philharmonic Orchestra, conducted by Kielland. **8.30,** Market Prices, Weather and News. **9.0,** Topical Talk. **9.15,** Recitations. **9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Report, Agricultural Notes, Report of the Royal Geographical Society and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Concert. In the intervals, Talk and Announcements. **10.0,** Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music. **7.5,** Talk. **7.30,** Musical Programme. **7.55,** Review of the Week. **8.0,** Talk on Music. **8.30,** Ta Bouche—Musical Comedy in Three Acts (Yvain). **10.30,** News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** News. **12 Noon,** Jewish Programme of Literature and Music. **12.30 p.m.,** Italian Opera Music—Gramophone Concert. Overture, The Thieving Magpie (Rossini); Dance of the Hours, from La Gioconda (Ponchielli); Duet from Lucia di Lammermoor (Donizetti); Overture, The Barber of Seville (Rossini); Aria from The Daughter of the Regiment (Donizetti); Overture, William Tell (Rossini); Aria from La Favorita (Donizetti); Miserere Duet from Il Trovatore (Verdi); Hymn from Iris (Mascagni); Duet from Madame Butterfly (Puccini); Impoviso fom André Chénier (Giordano); Aria from Resurrection (Alfano); Te Deum from Tosca (Puccini); Intermezzo from Cavalleria rusticana (Mascagni); March from Turandot (Puccini). In the interval at **1.0,** Exchange, News and Weather and at **1.30,** Exchange. **2.0,** Exchange and Announcements. **3.45,** Exchange and Market Prices. **4.30,** Elementary English Lesson. **6.20,** Agricultural Talk. **6.45,** Assurance Societies' Review. **7.0,** Talk: The Modern

Novel. 7.23, Gramophone Concert. Madrilla (Danjaume); Tango (Silesu); C'est le printemps (Moretti); Siempre (Bianco); Valse tremblante (Bosc); Chante mon flutian (Cloarec-Maupas); Ta promesse (Bordin); Malikoko (Avignon). 7.41, Commercial Prices and News. 8.0, Literary Talk. 8.30, News. 8.40, Gastronomic Talk. 8.45, The Polish Jew.—Play (Erckmann-Chatrian), with Music by Raymond Charpentier. In the interval at 9.15, News.

PITTSBURGH

KDKA, 980 kc/s, 305 metres; 50 kW.—Relayed by **W8XK** on **48.86 metres,** and **25.27 metres.—7.0 p.m.,** Musical Originalities, from **New York.** 7.30, KDKA Home Forum. 8.0, Words and Music, from **New York.** 8.30, Andrea Marsh, from **New York.** 8.45, Programme to be announced. 9.0, Betty and Bob, from **New York.** 9.15, Gene Quaw's Orchestra, from **New York.** 9.30, News and Markets. 9.45, Arcadians, from **New York.** 10.0, Uncle Tom and Betty. 10.15, KDKA Kidgies' Klub. 10.30, The Singing Lady, from **New York.** 10.45, Orphan Annie, from **New York.** 11.0, News.Reeler and Pat Haley. 11.5, Sports and Programme Preview. 11.30, Evensong. 11.45, Lowell Thomas, from **New York.** 12 **Midnight,** Amos 'n' Andy, from **New York. 12.15 a.m. (Saturday),** Silver Tappers. 12.30 **to 3.30, New York** Relay. 12.30, Potash and Perlmutter. 12.45, Irene Rich for Welch. 1.0, Popular Programme. 1.30, Dangerous Paradise. 1.45, Red Davis. 2.0, Let's Listen to Harris. 2.30, Variety Programme. 3.0, U.S. Army Band.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW. **3.0 p.m.,** See **Moravska-Ostrava. 3.55,** Talk by the Chairman of the Czechoslovak Sokols. 4.5, Schubert Concert by the Ondricek Quartet and Vaclav Stepan (Pianoforte). Pianoforte Quintet in A, Op. 114 The Trout; String Quartet in B Flat, Op. 168. 5.5, Market Prices. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission. Talk. 6.0, Time, News and Weather. 6.10, Talk in English: From the Chicago World Fair to Czechoslovakia. 6.25, See **Brno.** 7.0, See **Bratislava.** 8.0, Time Signal. 8.2, Talk. 8.15, Concert of Latvian Music for the Latvian Day of Independence. The Station Orchestra and Soloists: Zika (Violin), and Marsalk (Songs); Fantasia on Latvian National Songs for Violin and Orchestra, Op. 42 (Vitols); Latvian National Songs; Latvian Folk Dance for Orchestra, Op. 3, No. 3, Acikops (Jurjanis). 9.0, Time, News and Sports Notes. 9.15, News in Russian. 9.30 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.—6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from **Geneva**), Gramophone Concert. **12 Noon** (from **Geneva**), Financial Notes. **12.10 p.m.,** Gramophone Concert. 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, See **Schweizerischer Landessender.** 5.0 (from **Geneva**), Programme for Women. 5.30 (from **Geneva**), Esperanto Lesson. 5.40 (from **Geneva**), English Lesson. 6.5 (from **Geneva**), Talk on Bridge. 6.20 (from **Geneva**). Talk for Chess Players. 6.35 (from **Geneva**). Illustrated Talk: Newly-released Gramophone Records. 6.59 (from **Geneva**), Weather Report. 7.0 (from **Geneva**), Variety Concert by the Melody Dance Orchestra, conducted by Pasche, and Madame Berlie. 8.0 (from **Geneva**), Talk: Sorcery, Alchemy and the Black Art. 8.25 (from **Geneva**), Military Band Concert, conducted by Hoogstoel: Cortège from Déjanire (Saint-Saëns); Overture, Les sabots de Suzon (Popy); Marche funèbre d'une marionnette (Gounod); Indian March (Selleneck); Serenade (Pierné); L'éclaireur (Allier). 9.0, News and Weather. 9.10 (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW. **8.0 p.m.,** Musical Programme. 8.10, Weather. 8.20, Musical Programme and Announcements. 8.30, Reading. 9.0, Chimes. 9.2 (approx.), By the Fireside. 10.0, News. 10.30, Le Sacre du Printemps (Ballet (Stravinsky), on Gramophone Records.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres** from **7.15 p.m.;** and **2RO, 25.4 metres.—12 Noon to 1.15 p.m.,** Orchestral Concert. In the interval at 1.0, Time and Announcements. 2.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15, Vocal and Instrumental Concert: Adriana Dante Fusco (Pianoforte), Maria Grimaldi (Soprano), and Renata Pellegrino (Violin): Pianoforte Solos: (a) Tempo di ballo (Scarlatti), (b) Cadiz (Albéniz); Soprano Solos: (a) A Serpina penserete, from Le serva padrona (Pergolesi), (b) Aria from I quattro rusteghi (Wolf-Ferrari), (c) Colà nell'oasi verdi, from Dejanice (Catalani); Violin Solos: (a) Le Papillon (Fauré), (b) Serenata napoletana (Sgambati), (c) The Flight of the Bumble-Bee (Rimsky-Korsakov); Soprano Solo, Aria from I Pagliacci (Leoncavallo). 5.40 **(Naples),** Shipping and Sports Notes. 5.45, Dopolavaro Announcements and Tourist Report. 5.57, Report of the International Institute of Agriculture (in Spanish, German, and French). 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements, and Sports Notes. 7.15, See **Turin.** 7.30 (approx.), Concert of Latvian Music for Latvian Independence Day; Soloists, Lev Arnoff ('Cello) and Renato Josi (Pianoforte): Sonata, Op. 5 for 'Cello and Pianoforte (Burjanin); Aria (Medius); Elegy for 'Cello (Kalnins). 8.50, Caroline—Comedy in One Act (Herzeg). 9.15, Variety Concert. 10.0, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY; 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.—7.30 p.m.,** Friday Steeplechase, from New York. 12.45 **a.m. (Saturday),** Stock Reports. 1.0 to 4.0, **New York** Relay. 1.0, Concert. 2.0, Fred Allen; Ferde Grofe's Orchestra. 2.30, Orchestral Concert. 3.0, First Nighter, Sketch. 3.30, Friday Night Sociable. 4.0, Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. 9.20 (from **Basle**), Broadcast for Schools. 9.50 to 11.0, Interval. 11.0 (from **Basle**), Schubert Music on Gramophone Records. 11.29, Time Signal from Neuchâtel Observatory, Weather, and News. 11.40 (from **Basle**), Song Recital on Gramophone Records. 12.25 p.m. (from **Basle**), Time, Weather, and Exchange. 12.30 **to 2.30,** Interval. 2.30 (from **Zürich**), Gramophone Music. 2.59, Time Signal from Neuchâtel Observatory. 3.0 (from **Zürich**), Concert by the Radio Orchestra. 4.0, Gramophone Music. 4.10, Concert by the Small Station Orchestra, conducted by Scherbaum. 5.0 (from **Zürich**), Programme for Children. 5.30, Light Music by the Radio Orchestra. 6.0 (from **Berne**), Time, Weather, Market Prices, Tourist Talk, and Sports Notes. 6.20 (from **Berne**), Gramophone Music. 6.55 (from **Berne**), Old Classical Music for Violin and Harpsichord. 7.30 (from **Berne**), Talk: Has Parliamentary Government Reached a Crisis? 8.0, Weather and News. 8.10, An Opera in One Act (Carlo Cardara). 9.15 (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metrs; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 meires; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.—12 Noon to 12.30 p.m.,** Broadcast for Schools. 4.5, Programme for Children. 4.25, Country Music. 4.45, Gramophone Music. 5.45, Radio Report. 6.15, Weather and News. 6.30, Religious Talk: The Ecclesiastical Year from All Saints to Midsummer, relayed from **Uppsala, 652 kc/s, 453.1 metres.** 7.0, Concert by the Radio Orchestra, conducted by Tor Mann. Soloists: Henri Marteau (Violin). Symphony in E Flat, No. 39 (Mozart); Incidental Music to Pélleas et Mélisande (Sibelius). 7.55, Talk: Foreign Affairs. 8.15, Concert (contd.). Violin Concerto in C Minor, No. 3 (Aulin). 8.45, Weather and News. 9.0, Popular Concert by the Huddinge Male Voice Choir and Soloists. Four Choral Songs; Pianoforte Solos: (a) Romance in F Sharp (Schumann), (b) Scherzo in E Flat (Mendelssohn); Fantasia and Rondo for Clarinet and Pianoforte (Weber); Wiegenlied (Brahms); Melody (Berg); Song; Sonata for Two Clarinets (Poulenc); Pianoforte Solos Chopin): (a) Preludes in E Flat and in F, (b) Mazurka in A Minor, (c) Waltz in C Sharp Minor. 10.0 (approx.), Close Down.

STRASBOURG

859 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Gramophone Concert of Variety Music. 12.45 **p.m.,** News. 1.0, Time and Exchange. 1.5, Popular Music on Gramophone Records. 2.0, Interval. 4.45, Literary Talk. 5.0, Orchestral Concert, conducted by Roskam. Two Step, Ayerbe (Collnet); Waltz, Freuet euch des Lebens (Joh. Strauss-May); String Quartet: Rosa Mystica (Sinigaglia); Tango from Nina-Rose (Rotaberg); Selection from Les Cloches de Corneville (Planquette); It isn't fair, Foxtrot, Lies (Springer and Paris); Dialogue tendre (Gabriel-Marie); Boston, Blueridge Moon; Foxtrot Hello chérie (Pack and Rod); Birthday Serenade (Lincke); Spanish One-Step, Viva Espana (Van Harck). 6.0, Trio Concert, relayed from **Lille, 1,128.5 kc/s, 265.8 metres.** 7.0, Topical Talk in German. 7.15, Talk: The Relief of Vienna. 7.30, Time and News. 7.45, French March Music on Gramophone Records. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Religious Service, relayed from St. Joseph's Church, Nancy. 9.30 (approx.), Press Review. 9.35, The Eroica Symphony (Beethoven), by the Station Orchestra, conducted by Maurice de Villers. 10.30 (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.—12.35 to 1.30 p.m.,** See **Langenberg. 2.15,** Violin and Pianoforte Recital by Michael Schwester and Helene Renate Lang Sonata in A (Bach); Andante and Allegro from the Sonata in G (Haydn); Sonata in D Minor (Brahms). 3.0 **to 5.35,** See **Langenberg. 5.35,** Talk: Is your Skiing Equipment in Order? 5.50, Time and Agricultural Report. 6.0, Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0 to 9.20,** See **Frankfurt. 9.20,** Things you should know. . . . 9.30, Local News, Weather and Sports Report. 9.40 to 11.0, See **Langenberg. 11.0,** See **Frankfurt. 11.45** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 7 kW.—**6.0 p.m.,** News. 6.15, Accordion Music. 6.30, Chansonnettes. 6.45, Balalaika Music and Russian Songs. 7.15, News and Exchange. 7.30, La boite à joujoux (Debussy), by the symphony Orchestra. 7.45, Light Music. 8.0, Music by a Viennese Orchestra: Waltz, Tales from the Vienna Woods (Joh. Strauss); Moonlight, the Danube, and You (Gey); Wiener Zugvögel (Translateur); Murmure de bal (Meyer). 8.15, Opera Music: Aria from La Bohème (Puccini); Cavatina from Romeo and Juliet (Gounod); Selection from Mirella (Gounod); Cavatina from The Pearl Fishers (Bizet). 8.30, Wireless Talk: The Short-Wave Stations. 8.40, Military Music. 9.0, Concert of Music by Pares and Van Parys. 9.30, Orchestral Music. 9.45, Opera Music: Aria from La Favorita (Donizetti); Oh! Star of Eve from Tannhäuser (Wagner); Serenade from The Damnation of Faust (Berlioz); Air from Prince Igor (Borodin). 10.0, Orchestral Music. 10.15, News. 10.30, Concert for Listeners in Morocco. Part I, Extracts from Sound Films. Part II, Orchestral Music. Selection from La princesse jaune (Saint-Saëns); Ronde villageoise (Chabrier); Potpourri, Métropoliana (Brinkmann). 11.0, Chansonnettes. 11.15, Dance Music. 12 **Midnight,** News. **12.5 a.m. (Saturday),** Music by a Viennese Orchestra. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW. **4.10 p.m.,** 'Cello and Soprano Recital by Ettore Sigon and Elettra Camanzi (Soprano): 'Cello Solo, Toccata (Frescobaldi); Soprano Solo, Recitative and Aria from Xerxes (Handel); 'Cello Solo, Polonaise (Dvorák); Soprano Solos: (a) Toglietemi la vita ancor (Scarlatti), (b) Widmung (Schubert); 'Cello Solos (Ravel): (a) Pièce en forme de Habanera, (b) Malagueña; Soprano Solos: (a) Nel ridestarmi (Cilea), (b) Riflessi (Santoliquido). 5.0 till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—4.10 p.m.,** Chamber Music. 5.0 **to 5.5,** Weather. 5.40, Giornale Radio, Dopolavoro Notes, and Gramophone Music. 6.0, Time, Report of the Royal Geographical Society, and Gramophone Music. 6.10, Market Prices. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, News. 7.15, Sponsored Gramophone Music. 7.30, Talk. 7.45, Choral Concert. In the interval, Talk. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in German. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metras;** and **Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. In the interval at 10.55, Weather. 12 **Noon,** Time, Weather, News and Announcements. **12.10 p.m.,** Gramophone Concert. 1.0, Interval. 2.0, Time, Weather, and Exchange. 2.20, Talk: Cocoa and Chocolate. 2.35, Programme for Children. 2.55, Gramophone Records of the Emil Roosz Orchestra. 3.35, Reading. 4.0, Talk on Gardening. 4.20, Variations and Fugue on a Theme of Handel, Op. 24, for Pianoforte (Brahms), played by Julius Vargha. 4.55, Traffic Report. 5.10, Talk: The Austrian Ski-Society. 5.25, Sports Review of the Week. 5.35, Talk: Individuals and the Law. 6.0, Concert by the Tantenhayn Quartet, with Commentary. 6.50, Time, Weather, and Programme Announcements. 7.0, The Flood—Drama (Barlach). 8.50, Talk: Austria in the Winter. 9.5, News. 9.20, Dance Music, relayed from the Café Palmhof. Soloist: Toni v. Schmid (Songs). After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Concert of Operetta Music, relayed from **Lwów, 788 kc/s, 381 metres.** In an interval at 11.30, Radio Journal and Weather Report. 12 **Noon,** Interval. 2.30, Economic Notes. 2.40, News. 2.45, Talk for Boy Scouts. 2.50, Maritime and Colonial Notes. 2.55, Gramophone Music. 3.10, Duets from Operetta by Marie Kaupe (Soprano) and Laskowski (Tenor). Duets from: (a) Peppina (Stolz), (b) The Czarevitch (Lehár), (c) Viktoria and her Hussar (Abraham), (d) Paganini (Lehár), (e) The Gipsy Baron (Strauss). 3.40, Book Review. 3.55, Concert of Slav Music by Bulgarian Composers: Two Songs (Vladigerov); Two Songs (Dobri Christov); Pianoforte Pieces (Vladigerov), played by the Composer. 4.50, News. 5.0, Talk. 5.20, Dance Music on Gramophone Records. 6.5, Miscellaneous Items. 6.20, Talk: What to do on holidays. 6.25, Programme Announcements. 6.40, Radio Journal. 7.0, Talk on Music. 7.15, Symphony Concert by the Philharmonic Orchestra, conducted by Horenstein. Soloist: Kon (Pianoforte). Overture, A Midsummer Night's Dream (Mendelssohn); Pianoforte Concerto in E Flat (Beethoven); Verklaerte Nacht (Schönberg); Symphony No. 7 in A (Beethoven); Pianoforte Solos. In the interval at 8.0, Talk: Women Authors. 9.40, Sports Notes. 9.50, Gramophone Music. 10.0, Aviation Weather Report and Police Notes. 10.5, Gramophone Music (contd.).

ZURICH.—See **Schweizerischer Landessender.**

NOV. 17th FRIDAY *continued*

RADIO DRAMA AT BRUSSELS. A "Sketch Radiophonique" in progress at Brussels No. 1. Multi-studio presentation has not found its way into Belgium, and the "effects" are of the simplest description.

SATURDAY

NOVEMBER THE EIGHTEENTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes. **7.15,** Agricultural Report and Weather Forecast. **7.20,** Dance Refrains. **7.55,** News. **8.0,** Time. **8.2,** Concert by the Station Orchestra. Overture, Alceste (Gluck); Selection from The Daughter of the Regiment (Donizetti); Waltz, Dolores (Waldteufel). **8.30,** News. **8.35,** Airs from Operettas (Offenbach). **8.45,** Concert (contd.). Funeral March (Litoev); En barque (Viardot); Selection from The Merry Wives of Windsor (Nicolai). **9.30,** News. **9.35,** Readings from Plays (de Musset). **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time, Weather, Stock Report, and Gramophone Music. **6.0,** Gramophone Concert. **6.45,** News. **7.0,** Romeo and Juliet—Opera (Gounod). **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Dance Music; Morning, Noon, and Night; Butterflies in the Rain; In the Park in Paree; The Last Round Up. **9.45,** Accordion Music: Swanee (Gershwin); Marchè Volante (Baptiste); Accordion Duet: Lido Lady Mazurka (Perry); Coal Black Mammy (St. Helier). **10.0,** Concert. Dance Music: This Time it's Love; Home on the Range; Twenty Million People; The Grass is getting Greener; Lazybones; Sweet Dreams, Pretty Lady. **10.30,** I.B.C. Good-night Melody. **10.32,** News and Weather. **10.40,** Uilleann Pipes. **10.50,** Accordion Solos by J. Carey. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**7.0 p.m.,** Request Gramophone Records. **7.30,** Exchange and Gramophone Records (contd.). **8.0,** Gramophone Music. **8.15,** Anti-War Talk and News. **9.0,** Chimes from the Cathedral, Weather, Exchange, and Market Prices. **9.5,** Educational Programme. **9.35,** Concert by the Radio Orchestra: Prelude to Werther (Massenet); Spanish Rhapsody (Ravel); Entr'acte from La Habanera (Laparra); Persian Dance (Guiraud). **10.5,** Song Recital by Nelly Santigosa. **10.30,** Dance Music, relayed from the Bodega Andaluza. In the interval at **11.0,** News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Children. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down. See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**5.55 p.m.,** Time and Announcements. **6.0,** Programme to be announced. **6.30,** Choral Concert. **7.20,** Violin Recital. **8.0,** Talk. **8.30,** Popular Songs. **9.0,** Time and News. **9.15** (approx.), Concert by the Station Orchestra. **10.0,** Dance Music from the Auto Club.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**1.0 p.m.,** Gramophone Concert: Fortrot Fensterpromenade (Mohr); Foxtrot, Wenn der Tag zur Neige geht; Tango, Zigeunerweisen (Rodrigues); Ich weiss nicht, was ich denken soll (Niel); Waltz, Warum liebt der Franz die Theres (Hinterstübl); Tango, Ein kleines bisschen Liebe (Carste); Foxtrot, Liebling (Lachner); Tango, Aromas de los Andes (Pörschmann); Foxtrot, Ich bin verliebt in jede Frau (Meisel); Waltz, The Song is ended (Stolz); Tango, in einer Frühlingsnacht (Dostal); Waltz, Ohne dich ist die ganze Welt tür mich ohne Sonne (Köhler-Arlen); Foxtrot, Los Marimberos (Pörsehmann); Tango, Jetzt ist die Welt so schön (Koszalski); Tango, Wenn man auseinandergeht (Engel-Berger); Foxtrot, Deutscher Himmel (Joost-Domina). **2.0,** Programme for Children. **2.30,** Weather and Exchange. **2.45,** Reading. **3.0,** See **Hamburg. 4.0,** Weekly Sports Review. **4.20,** Pianoforte Recital by Walter Gieseking: Partita in C minor No. 2 (Bach); Sonata, Op. 101 (Beethoven); Intermezzi (Brahms). **5.0,** Poems. **5.5,** Talk on Acrobatics. **5.25,** Portraits of German Girls. **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Langenberg. 7.0,** To-day's Quotation. **7.5,** A Students' Evening. **9.0,** Weather, News and Sports Notes. **9.45,** Weather. **10.0,** Radio Report of the Six Days' Racing in the Sportpalast. **10.10,** Serenade relayed from **Munich. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB** and **DJE.—3.0 p.m.,** Concert by an Orchestra of Unemployed Musicians, conducted by Werner Dickow: Overture, Der Schauspieldirektor (Mozart); Suite (von Hannenheim); Overture, Carneval in Rom (Joh. Strauss); Lagunen-Walzer (Joh. Strauss); Polonaise (Kullak); Selection from Der Tenor der Herzogin (Künneke); Suite, Op. 5, No. 1 (Witte). In the interval at **4.0** (approx.), A Discussion on Physical Exercises. **4.30,** Weekly Sound News. **5.0,** Song to the Lute. **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Langenberg. 7.5 to 12 Midnight,** Variety Programme. Der Wachtel singt bei Kroll—Radio Picture of Old Berlin (Brennert). The Station Orchestra, conducted by Ewald Huth, and the Station Choir, conducted by Heinzkarl Weigel. Dance Music by the Herbert Strauss Band. In the intervals at **9.0** (approx.), News and Sports Notes, and at **10.0** (approx.), Topical Talk. **12 Midnight,** Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,076 kc/s, 279.3 metres; 14 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Zdenek Folprecht. **3.30,** See **Prague. 4.15,** A Comedy (Zemla). **5.15,** Talk for the Housewife. **5.30,** Gramophone Music. **5.40,** Topical Talk. **5.50 to 9.55,** See **Prague. 9.55,** See **Moravska-Ostrava. 10.30** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—10.45 a.m.,** Concert by the Station Orchestra, conducted by Gerhard Rischka: Overture, Lodolska (Cherubini); Selection from Mareike von Nymwegen (d'Albert); Scandinavian Suite (Juel-Frederiksen); Potpourri, Kontraste (Robrecht); Russian Dance No. 5 (Bullerian); Overture to a Revue (Lincke); Viennese Dance No. 1 From the Rhine to the Danube (Rhode); Waltz, Roses from the South (Joh. Strauss); Gruss aus Bad Hersfeld (Becker). **12.45 p.m.,** Time and News. **1.10,** Gramophone Concert. **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.30,** Talk: Programmes for the Coming Week. **2.45,** Review of the Week's Films. **3.0,** Concert by the Silesian Philharmonic Orchestra, conducted by Ernst Prade: Prelude to Hansel and Gretel (Humperdinck); Suite from L'Arlésienne (Bizet); Waltz from Der Rosenkavalier (R. Strauss); Three Swedish Dances (Graener); Academic Festival Overture (Brahms); Waltz, Mein Lebenslauf ist Lieb und Lust (Jos. Strauss); Military March (Kaun). **4.50,** Tales of Old Breslau. **5.10,** Programme to be announced. **5.40,** Programme Announcements and Meat Market Prices. **6.0,** Transmission for all German Stations relayed from **Langenberg. 7.0,** News. **7.10,** Wiener Blut—Operetta in Three Acts (Joh. Strauss) relayed from the Municipal Theatre. In the intervals, News. **10.10,** Dance Music relayed from **Berlin (Funkstunde). 11.30** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News and Recitations. **5.50,** See **Prague. 9.55,** See **Moravska-Ostrava. 10.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Radio Orchestra, conducted by Charles Walpot; Soloists, René Durand (Tenor) and Steurs (Accordion): March, Flottez drapeaux (Paradis); Overture, Masaniello (Auber); Waltz, Ange d'amour (Waldteufel); Songs from Viktoria and her Hussar (Abraham); Die schöne Japanerin (Siede); Gavotte (Lincke); Songs with Accordion Accompaniment; Ballet Suite (Popy). **1.0 p.m.,** Le Journal Parlé. **1.10,** Lalo Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans; Soloist, Mme. Godenne-Loots (Songs): Ballet Music from Namouna; Recitative and Margaret's Aria from Le Roi d'Ys; Scherzo; Overture, Le Roi d'Ys. **4.45,** Talk arranged by the Belgian Touring Club—The Problem of Belgium's Roads. **5.0,** Concert, relayed from the Plazza. **6.0,** Talk: Ultra-Violet Rays. **6.15,** Pianoforte and Violin Recital by Mme. Husson-Michaux and M. Guller: Suite in the form of a Sonata (Sevenants); Chant hébraïque (Blockx). **6.45,** A quoi rêvent les garçonnes—Sketch (Lauville). **7.0,** Gramophone Concert dedicated to Latvia. **7.30,** Le Journal Parlé. **8.0,** Programme by Wiener and Doucet. **8.45,** Recitation of Modern Belgian Poems: Extracts from the Works of Waller, Rodenbach, Giraud, Verhaeren, Gilkin, Severin, Gille, and Van Arenbergh. **9.0,** Concert by the Radio Orchestra, conducted by Charles Walpot: Marche russe Waltz, The Blue Danube (Joh. Strauss); (Ganne); Overture, William Tell (Rossini); Selection from The Merry Widow (Lehár); Maremba Solo, Funny Notes (Nicholls); Potpourri, Un thé chez Stolz (Dostal). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans: Overture, Euryanthe (Weber); Persian Dance (Mussorgsky); Romanian Rhapsody (Enesco); Three Flemish Songs by Mme. Godenne-Loots; Serenade (Waelput); Waltz from Charlotte Corday (Benoit); Festival Overture (De Mol). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Radio Orchestra, conducted by Walpot; Soloist, Steurs (Accordion): Unie-marche (Walpot); Festival Overture (Leutner); Selection from La Fille de Madame Angot (Lecocq); Bells across the Meadows (Ketelbey); Accordion Solos; Ballet Music from Faust (Gounod). **5.0,** Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans: Overture: Titus (Mozart); Basque Rhapsody from Ramuntcho (Pierné); Selection from 'Le festin de l'araignée (Roussel); Suite (Van Doren); Tarantelle (Cui); Jeux d'enfants (Bizet). **6.0,** Jazz Music with Commentary. **7.0,** Gramophone Concert: March from The Prophet (Meyerbeer); Three écossaises (Chopin); Air from The Pearl Fishers (Bizet); Persian Dances from Khovantschina (Mussorgsky); Air from L'Elisir d'amore (Donizetti); Overture, La Vestale (Spontini). **7.30,** Agricultural Review. **8.0,** Madame Butterfly—Opera (Puccini), relayed from the Royal Flemish Opera House, Antwerp. In the intervals, Recitations and Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert of Music for Children by the Station Orchestra: Baby plays Soldiers (Micheli); Suite, Kinderszenen (Schumann); Jeux d'enfants (Bizet); Babillage (Gillet); Children's Songs (Blech). **5.0,** Radio Journal. **5.15,** The Station Orchestra: Ballet Music from La Juive (Halévy); March, El Capitan (Sousa). **5.30,** Banjo Duets and Whistling Solos by Jean Abagiu and Clara Imasesco. **6.0,** Gramophone Music. **6.45,** Talk. **7.0,** Concert by the Silvestru Church Choir, conducted by Seinesco. **7.30,** Talk. **7.45,** Song Recital. **8.15,** Double Concerto (Bach) on Gramophone Records. **8.45,** Radio Journal. **9.0,** Romanian Music by the Station Orchestra.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **7.10 p.m.** till Close Down.—**3.45 p.m.,** News, Weather and Time. **4.0,** Recital of Hungarian Folk Songs by Margarete Karácsonyi, accompanied by the Karkas Cigány Band. **5.0,** Talk. **5.30,** Orchestral Concert, conducted by Polgár: Overture, Baron Robus (Huszka); Waltz, Liebesbilder (Fazeller); Potpourri (Márkus); Two Pieces (Seregi); Foxtrot (Farkas); Melody (Jessel); Potpourri (Turry). **6.30,** Answers to Correspondence. **7.10,** Gramophone Music. **7.40,** News. **8.0,** Variety Concert, conducted by Köpeczi Bocz. **9.0,** Weather, followed by Music by the Rezsö Horváth Cigány Band, with Popular Songs and Hungarian Folk Songs by Imre László, relayed from the Emko Café.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres,** and **Skamlebaek, OXY.—11.0 a.m.,** Time and Chimes from the Town Hall. **11.5,** String Ensemble Concert, relayed from the Wivex Restaurant. **1.0 p.m.,** Gramophone Music. **1.30,** Reading in Jutland Dialect. **2.0,** Concert by the Radio Orchestra, conducted by Emil Reesen: Soloist: Mia Larsen (Songs); Overture, The Merry Wives of Windsor (Nicolai); Waltz, Gold and Silver (Lehár); Ballet égyptien (Luigini); Swedish Folk Melody (arr. Svendsen); Homage March from Sigurd Jorsalfar (Grieg); Songs; Tarantella from Masaniello (Auber); Selection from La boutique fantasque (Rossini-Respighi); Waltz, Die Hydropathen (Gungl); Two Arabesques (Debussy): (a) No. 1 in E, (b) No. 2 in G; Overture, Poet and Peasant (Suppé). **4.0,** Programme for Children. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: The Thorvaldsen Museum. **5.15,** French Lesson. **5.45,** Weather. **5.54,** Anuouncements. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk. **7.0,** Chimes from the Town Hall. **7.5,** Old Italian Sonatas for Violin and Harpsichord: Sonata in G Minor, Op. 5, No. 5 (Corelli); Sonata in A Minor (Tartini). **7.30,** A Visit with the Microphone to Copenhagen Harbour. **8.0,** Concert by Louis Preil's Instrumental Ensemble and the Asmuss Quartet: Soloist: Lulu Ziegler (Songs); Two Airs from Mahagonny (Weill); Recitation; Dance Music by the Asmuss Quartet; Recitations; Songs; Dance Music by the Asmuss Quartet. **9.0,** News. **9.15,** Dance Music by Louis Preil's Dance Band. In the interval, Gramophone Records. **11.15** (approx.), Close Down.

CORK.—See **Athlone.**

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—**5.55 p.m.,** See **Warsaw.** In an interval at **6.10,** Programme Announcements. **9.0,** Gramophone Music. **9.15,** Sports Notes. **9.25** till Close Down, See **Warsaw. 11.0** (approx.), Close Down.

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. till 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Orchestral Concert. Part I: Signature Tune: The Tiger's Tail (Thurban); Spanish Serenade (Herbert); Chinese Serenade (Herbert); The Grasshoppers' Dance (Bucalossi); Selection from H.M.S. Pianoforte (Sullivan); The Clatter of the Clogs (Flynn); Wedgwood Blue (Ketelbey); Beautiful Spring (Lincke); Selection from He Wanted Adventure (Waller). Part II: Dance Music: I've got to pass your House; Happy as the Day is Long; I remember you from Somewhere; Blue Cloud; I live for Love; Sweet Dreams, Pretty Lady; Lazybones; My Gipsy Rhapsody; Signature Tune. **12 Noon,** Programme in French. **4.30 to 6.0 p.m.,** Programme in English by the I.B.C. **4.30,** The I.B.C. Nursery Corner with Columbus and Belinda. Birthday Greetings. Trumpets. **4.40,** Concert of Balalaika Music for Tunbridge Wells and Isle of Thanet Listeners. Waltz-Impromptu (Andriev); The Red Sarafan (arr. Leontiev); Mazurka (Wieniavsky); Balalaika Solo: Moonlight; Lovely Night (arr. Leontiev); Choir: The Twelve Robbers; Shining Moon (Traditional); Troika and a Lady (Andriev); Song of the Volga Boatmen (Traditional). **5.20,** Orchestral Concert for Dover and Folkestone. The Wedding of the Winds (Hall); Song, Lolita (Peccia); Ideale (Tosti); The Butterfly (Nevin); Song. When it's Sleepy Time Down South (Mule); Wedgwood Blue (Ketelbey); Selection from The Gipsy Princess (Kálmán); Signature Tune. **5.45,** Concert of Dance Music. With You Here and me Here; Lou'siana Lullaby; Wood Violets; Egypt. **6.0,** Programme in French. **11.0** till Close Down. Programme in English by the I.B.C. Signature Tune, Sittin' in the Dark; Selection from He wanted Adventure (Waller); The Whip (Harbach); Happy Ending (Parr-Davies); There's Something about a Soldier (Gay); Dance, Pretty Lady (Strauss); Sweep (Ellis); Selection from The Kid from Spain (Kalmar); Sweetheart Darlin' (Stodhart); Signature Tune. **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd. Signature Tune: Come Back to Erin; Toreador et Andalouse (Rubinstein); Kashmiri Love Song (Woodforde-Finden); Banjo Solos: (a) Mullingar Races, (b) Wexford Lassies; Mock Morris (Grainger); Vienna Maidens (Ziehrer); Selection from Les millions d'Arlequin (Drigo); Song, Danny Boy (arr. Weatherley); Golliwog's Cakewalk (Debussy): Signature Tune, Come Back to Erin. **12.5 a.m. (Sunday),** Late News. Bulletin in English. **12.10** (approx.), Club Concert for March Listeners. Signature Tune: The Chun Song; Oh! Johanna (Lawrence); Snowball (Carmichael); The Wedding of Mr. Mickey Mouse (Pola); Solitario (Burli); Lover (Rodgers); The Last Round Up (Hill); Dinner at Eight (Fields); I'll show you off (Hamnerstein); Adios Goodbye (Frankau); Moths around the Candle Flame (Randal); If you'll say Yes, Chérie (Noble); It's the Talk of the Town (Symes). **1.0,** Dance Music. Signature Tune: Bells of Normandy. Mahogany Hall Stomp; Tick, Tock; My Moonlight Madonna; Cecilia Lay your Head on my Shoulder; Isn't this a Night for Love?; I Bring a Song; Egypt; Sing another Line; Lazybones; Wedding of the Dragon Flies; Louisville Lady; Sweet Dreams, Pretty Lady; Carry me back to Green, Green Pastures; At the Old Pig and Whistle; Aloha Aoe! Goofus; Signature Tune. **2.0 a.m.,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel, 1,220 kc/s, 245.9 metres;** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.25,** News and Weather. **12.35,** See **Langenberg. 2.10,** See **Stuttgart. 2.30,** Weather. **2.40,** Time and Economic Notes. **3.0,** See **Langenberg. 5.0,** Talk: The German Frontier Problem. **5.20,** Review of the Week's Events. **5.35,** Surprise Programme. **5.50,** Weather, News and Programme Announcements. **6.0,** Transmission for all German Stations relayed from **Langenberg. 7.0,** Topical Talk. **7.10,** See **Stuttgart. 8.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News and Weather. **9.45,** Talk: The Dancer, Palucca.

NOV. 18th SATURDAY *continued*

10.0, See **Berlin (Deutschlandsender)**. 10.10, Variety Concert. 11.0, See **Stuttgart**. 1.0 a.m. **(Sunday)**, Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

Call ha (in Morse), 806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—3.0 p.m., Concert by the Hamburg Philharmonic Orchestra, conducted by José Eibenschütz, relayed from the Musikhalle: Overture, Donna Diana (Reznicek); In the Steppes of Central Asia (Borodin); Waltz from Eugene Onegin (Tchaikovsky); Serenade (Meyer-Helmund); Overture, Irrfahrt ums Glück (Suppé). 4.0, Military Talk, followed by Topical Programme. 4.30, Variety Programme, relayed from the Radio Exhibition. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from **Langenberg.** 7.0, See **Berlin (Deutschlandsender).** 9.0, Time and News. 9.30, Programme relayed from **Berlin (Funkstunde).** 12 Midnight, Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—10.30 a.m., Concert by the Small Station Orchestra, conducted by Eugen Wilcken. 12.5 p.m., Concert of Operetta Music, on Gramophone Records: Offenbach Potpourri; Selection from Frasquita (Lehár); The Gipsy Princess (Kálmán); Der Bettelstudent (Millöcker) and the Gipsy Baron (Joh. Strauss); Finale from Act II of Die Fledermaus (Joh. Strauss); Selection from Die schöne Galathee (Suppé); Overture, Orpheus in the Underworld (Offenbach); Selection from Countess Maritza (Kálmán); and the Cousin from Nowhere (Kunneke); Lagunen-Walzer from Eine Nacht in Venedig (Strauss); Overture, Die schöne Galathee (Suppé). In the intervals at 12.20 and 1.0 p.m., News. 1.30, Programme arranged by the Post Office, with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.5, Concert for Children by the Small Station Orchestra, conducted by Eugen Wilcken: Overture (Cortopassi); Fantasia on Children's Songs (Rohlée); Xylophone Solos (Kockert): (a) Der kleine Pfiffikus, (b) Bleisoldaten; Suite, Aus einem Puppenhaus (Engleman); Folk Songs (Egg); Kinderlieder-Marsch (Komzak). 3.0, Talk: Photography in Winter. 3.15, Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Le Roi d'Yvetot (Adam); Selection from La rondine (Puccini); Marien-Walzer (Jos. Strauss); Bih und Bob (Demaret); Rusticanella (Cortopassi); Overture, Gri-Gri (Lincke); Selection from The Bird Fancier (Zeller); Waltz, Herzdame (Bayer); Eine Sängerfahrt nach Wien (Silving). In the interval at 4.0 (approx.), ADAC Traffic Report. 4.50, Talk: The Sinking of the Friedrich Carl off the East Prussian Coast. 5.5, Programme Announcements. 5.15, Agricultural Prices. 5.25, Violin and Pianoforte Recital by Clementine and Leopoldine von Hermann: Adagio sostenuto (Pugnani); Fugue in G (Tartini); Pastorale and Caprice (Scarlatti); Andantino (Martini); Minuet (Porpora). 5.50, Weather. 6.0, Transmission for all German Stations, relayed from **Langenberg.** 7.0, News. 7.10, East German Programme. 8.10, Programme to be announced. 9.0, News and Sports Report. 9.15 (approx.), Dance Music, relayed from **Berlin (Funkstunde).** 11.30 (approx.), Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m., and 20 kW. from 5.40 p.m.—11.40 a.m. till Close Down, Programme of the Workers' Radio Society (V.A.R.A.).—11.40 a.m., Concert of Light Music by De Fliererfluiters, conducted by Van der Horst. Soloist: John Burns (Songs). In the interval, Gramophone Records. 12.40 p.m., Concert by the Small V.A.R.A. Orchestra, conducted by De Groot. Les banderillos (Volpatti); Miniature Overture (Tchaikovsky); Dreaming (Joyce); Erotica (Grieg); Serenade (Rachmaninov); Melancholy (Bull); Fantasia (Schumann); Gramophone Records; Selection from Phi-Phi (Christine); I'm dreaming (Burke); Millöcker Potpourri (Morena). 1.40, Interval. 1.55, Gramophone Records. 2.40, Fashion Review. 3.0, Gramophone Records. 3.20, Talk on Films. 3.40, Concert by the V.A.R.A. Children's Choir, conducted by Leida Hulseher. Soloist: Jo Kickhefer (Pianoforte). 4.20, Literary Talk. 4.40, Dance Music by Jack Bee and his Blue Bees. 5.40, Concert of Waltzes by the V.A.R.A. Orchestra, conducted by De Groot: Abendstern (Lanner); Delirienwalzer (Jos. Strauss); Pestherwalzer (Lanner); Neu Wien (Joh. Strauss); Hofballtänze (Lanner). 7.35, S.O.S. Messages. 7.40, Talk on the Modern Woman. 8.0, Orchestral Concert, conducted by De Groot: Overture, Die schöne Galathee (Suppé); My Lady Brocade (Ketelbey); Melody (Lucchesi); Waltz, Elise (Friml); Schön Rosmarin (Kreisler); La lettre de Manon (Gillet); Selection from The Gipsy Princess (Kálmán). 8.40, News. 8.55, De booze buurvrouw—Operetta in One Act (J. B. Klerr). 9.55, An Address. 10.10, Concert by the Utrecht Municipal Orchestra, conducted by Tiggers: Overture, Tancred (Rossini); Selection from Coppélia (Delibes). 10.40, Gramophone Music. 11.40 (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW until 3.40 p.m. Transmitted from Kootwijk on 50 kW from 3.40 p.m. Programme of the Catholic Radio Society K.R.O.—11.55 a.m., Concert by the K.R.O. Sextet: Spanish March (Grit); Chant sans paroles (Tchaikovsky); Waltz, Etincelles (Waldteufel); Plaisir d'amour (Martini); Offenbach Potpourri (Conradi); Tarantella (Smith); Gramophone Music: Marche de Carmen (Oscheit); Lortzing Potpourri (Rosenkranz); Ein Liebesmärchen (Naef); Finale. 1.40, Programme for Young People. 2.10, Programme for Children. 3.40, Concert by a Mouth Organ Ensemble. In an interval at 3.50, Gramophone Music. 4.10, Writing Lesson. 4.40, Gramophone Music. 4.55, Esperanto Notes. 5.10, Concert by the K.R.O. Boys, conducted by Lustenhouwer. In an interval at 6.0, Press Review. 6.40, Police Notes. 6.55, Talk by J. M. Gammeke, the Amsterdam Inspector of Police. 7.15, Gramophone Music. 7.25, Talk for Women. 7.40, Variety Concert by the K.R.O. Orchestra, conducted by van 't Wond and the Two Hollars. Soloists: Jeanne Horsten (Songs) and Theunisse (Pianoforte): Gramophone Music; News; Song; Parade of the Tin Soldiers (Jessel); The Forge in the Forest (Michelis); Die beiden kleinen Finken (Kling); Dance of the Merry Mascots (Ketelbey); Der alte Brummbär (Fucik); Dutch Peasant Dances (Siep); Accordion Music; De Rotterdamsche vlag (Verhallen); Zoo Zingt Holland (Sluiter-Hoogehoom); Song; Accordion Music; Ein Melodientraum (Urbach); News; Song; Selection from Die Puppenfee (Bayer); Selection from and Overture to Czar and Carpenter (Lortzing): Hurra, die Musik kommt! (Zimmer); Gramophone Music. 11.40 (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Financial Notes, Racing Results and News. 8.10, Tourist Talk. 8.25, Radio Concert. In the interval at 9.0, News and Weather.

KALUNDBORG.—See **Copenhagen.**

KATOWICE

734 kc/s, 408 metres; 16 kW.—5.55 p.m. till Close Down, See **Warsaw.**

KAUNAS

155 kc/s, 1,935 metres; 7 kW.—6.0 p.m., Time, Weather, and Announcements. 6.30, Concert: March, Jägerteue (Witte); English Waltz (Weiss); Italian Suite (May); Zug der Gnomen (von Blon). 7.0, Talk. 7.20, Sports Notes. 7.30, Latvian Independence Day Concert. The Station Orchestra and Soloists: Zelma Krievkalus and Herberts Ozolitis (Songs). Address by M. J. Paleckis; Dramatic Overture (Vitol); Suite, Seven Folk Songs (Vitols); Songs; Suite (Medins); March (Jurjana).

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by **Helsinki, 815 kc/s, 368.1 metres.**—5.15 p.m., Concert by the Radio Orchestra, conducted by Toivo Haapanen. 5.40, Talk. 6.5, Song Recital by Hertha Luse. 6.35, A Play (Maurey). 7.0, Concert by the Radio Orchestra: Overture, Raymond (Thomas); Ein Abend in Toledo (Schneling); Waltz from Eugene Onegin (Tchaikovsky); Idyll (Merikanto); Waltz (Palmgren); 'Cello Solo: Le Cygne (Saint-Saëns); Song from Der Trompeter von Säkkingen (Nessler). 7.45, News in Finnish. 8.0, News in Swedish. 8.15, Dance Music, relayed from the Grand Restaurant. 10.0 (approx.), Close Down.

LANGENBERG

635 kc/s, 473 metres; 60 kW.—12.25 p.m., News and Weather. 12.35, Gramophone Concert. 1.30, Talk: Books for the Hitler Jugend. 2.10, See **Stuttgart.** 2.30, Market Prices. 2.50, The Examination of Witnesses—Humorous Sketch in Dialect (Rottmann). 3.0, Dance Music. 4.0, Concert. The Station Orchestra, the Station String Quartet, the Cologne-Bickendorf Male Voice Choral Society and Soloists: Lieselotte Mann (Contralto), Heinz Hoersch (Tenor) and Egbert Grape (Pianoforte): Minuet (Mozart); Three Choral Songs; Nachtlied im Walde; Minuet (Boccherini); Folk Songs; Minuet (Mozart); Four Choral Songs; Minuet (Bach); Abends am Strande; Folk Song, Frau Wirtin, habt ihr uns nicht gern im Haus; Von einem Politico; Auf, Ansbach-Dragoner. 5.0, See **Frankfurt.** 5.35, Talk. 5.50, Announcements. 6.0, Transmission for all German Stations: The Feast of Fools—Rhenish Humour in Literature and Song (arr. Laurenz Kiesgen). 7.0, See **Frankfurt.** 7.10, See **Stuttgart.** 9.0, See **Frankfurt.** 9.20, See **Stuttgart.** 9.30, News and Sports Report. 9.45, See **Frankfurt.** 11.0, See **Stuttgart.** 12 Midnight, Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—11.5 a.m. (from **Dresden**), Concert by the Pfietzsch Marko Orchestra: Overture, Cleopatra (Mancinelli); Waltz from Im Reiche des Indra (Lincke); Intermezzo from The Arabian Nights (Joh. Strauss); Symphonic Poem, Helvetia (Scassoa); Gipsy Suite (Coleridge Taylor); Intermezzo and Gavotte (Ketelbey); Overture, A Night in May (Wood); Weber Potpourri (Schreiner); Three Pieces for Strings (Komzak); Waltz Potpourri (Robrecht); Oriental Dance (Vollstedt); Suite in Four Movements, Im Märchenwald (Fletscher); Festival March (Trenkler). In the interval at 12.15 p.m., News and Programme Announcements. 1.15, News. 1.30, Programme for Children. 2.20, Review of the Week's Events. 2.35, Market Prices and News. 3.0, See **Hamburg.** 4.0, Agricultural Review. 4.20, A Modern Dictionary. 4.40, Recital of Music for the Guitar. 5.0, German for Germans. 5.20, Reading. 5.50, Review of the Day's News. 6.0, Transmission for all German Stations, relayed from **Langenberg.** 7.0, Bunter Abend. 9.0, News. 10.0, Dance Music by the Emde Orchestra. 11.0 (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Lesson in Philosophy. 6.30, Review of Foreign Affairs. 7.0, Quartet Concert. 7.30, National Melodies. 8.0, Concert of Waltz Music by the Station Orchestra. 9.0, News, followed by Dance Music.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—French Programme. 7.0 p.m., Symphony No. 3 in C minor (Saint-Saëns) for Organ and Orchestra (on Gramophone Records). 7.35, Gramophone Concert of Variety Music. 7.55, Theatre Review. 8.5, Concert by the Radio Orchestra, conducted by Henri Pensis: Overture, Mignon (Thomas); Les Yeux (Paladilhe-Mouton); Nocturne in D flat (Debussy-Salabert); Paysage sentimental (Debussy-Salabert); Piece in the Form of Habanera (Ravel); Elégie (Massenet); Military March (Saint-Saëns). In an interval at 8.30, Topical Talk. 8.50, News in French. 9.0, Variety Concert by the Radio Orchestra, conducted by Henri Pensis. 9.50, News in German. 10.0, Song Recital by Marie-Thérèse Grosfils-De Cuyper. 10.25, Gramophone Concert of Variety Music. 10.50, Dance Music by the Radio Jazz Band, conducted by Ferry Jusa.

LWOW

788 kc/s, 381 metres; 16 kW.—6.10 p.m., Programme Announcements. 6.20, See **Warsaw.** 8.5, The Letter Box. 8.15, See **Warsaw.** 11.0 (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—7.35 p.m., Radio Gazette for Lyons and the South East. 8.30, An quai—Revue (Jean Bounot), from the Guignol Mourguet. After the Programme, News.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 10 kW.—6.0 to 8.0 p.m., Programme for Listeners in the Canary Islands, Guinea and Europe. 6.0, Concert of Popular Music. 7.15, Talk. 7.30, Light Music. 8.0 to 10.30, Interval. 10.30, Popular Concert. In the interval at 10.45, Radio Chronicle. 11.45, Light Music. 12 Midnight till Close Down, I.B.C. Concert of Light Music: Selection from The Vagabond King (Friml); Dream Tangles (Schumann); Star Song; The Rosary (Navin); Selection from Congress Dances (Heymann); Black Eyes (Traditional); The Skaters' Waltz (Waldteufel). 12.30 a.m. (Sunday), I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes. Exchange, Topical Talk. Talk and Dance Music. 8.15, Topical Review. 8.30 to 9.15, Interval. 9.15, English Lesson. 9.30, Chimes, Time, Topical Talk and Relay of European Stations. 10.30, Readings. 10.45 (approx.), Violin Recital by Jose Maria Sedano, Competitor in the Union Radio Musical Competition: La Folia (Corelli); Second Movement from the Sonata No. 1 (Bach); The Song of the Nightingale (Sarasate); Introduction and Rondo caprieioso (Saint-Saëns). 11.45, Topical Review. 12.0 Midnight, Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s. 263.8 metres; 11 kW.—5.50 p.m., See **Prague.** 9.55, Variety Programme by the Station Orchestra, conducted by Plichta and Members of the National Theatre. 10.30 (approx.). Close Down.

MOSCOW

TRADES UNION, 250 kc/s, 1,304 metres; 100 kW. Relayed by **Moscow, RW59.**—10.45 a.m., Weather. 1.45 p.m., Weather. 2.0, Concert of Russian Music with Commentary. 3.0, English Lesson. 3.30, Talk and Recitations. 4.30, An Operetta for Young People. 5.30, Concert Version of Don Giovanni—Opera (Mozart). 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—3.30 p.m., Orchestral Concert conducted by Erich Kloss. 4.45, Talk for Young People: Ice Hockey. 5.0, Community Singing by Children. 5.15, Beethoven Pianoforte Recital by Hans Martin Theopold: Two Bagatelles in G, Op. 126, No. 1, Bagatelle No. 3, in E flat; Rondo a capriccio, in G, Op. 129. 5.45, Wireless Notes. 6.0, Transmission for all German Stations relayed from **Langenberg.** 7.0 (from **Nürnberg**), Paul Schuppe Concert by the Coburg Mandoline Society, conducted by the Composer: Bergholdscher Mandolinen-Marsch; Prelude; Fantasia on the Song Verlassen bin ich; Waltz, Herbstblumen; March, Es welken alle Blätter. 7.35, Literary Programme. 8.5, Dance Music by the Station Dance Band. 9.0, Time, News and Sports Notes. 10.0, Serenade by the Bavarian Schrammel Ensemble with Paula Menari (Viennese Songs). 11.0 (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s. 1.083 metres; 60 kW. Relayed by **Fredriksstad. 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres; and Jeloy LCL, 6,990 kc/s, 42.92 metres.**—3.30 p.m., Gramophone Music. 4.15, Programme for Children. 5.45, Talk on Economics. 6.0, Announcements, Weather and News. 6.30, Talk. 7.0, Time Signal. 7.1, Concert by the Station Orchestra, conducted by Kramm: March Potpourri (Koehmann); Selection from Schön ist die Welt (Lehar); By the Blue Hawaiian Waters (Ketelbey); Dervishes Chorus (Sebek); Selection from Margitta (Meyer-Helmund); Gipsy Polka (Weinberger); Lapendularmoniosa (Pick-Mangiagalli); Dance Scene (Halvorsen); Potpourri (Yoshitomo). 8.10, Songs and Review of the Week. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Recitation, relayed from **Bergen, 824 kc/s, 364 metres.** 9.45, Dance Music on Gramophone Records. 11.0 (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—7.0 p.m., Dopolavoro Announcements. Tourist Report, Agricultural Notes and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.25, Sports Notes, and at 7.30, Time and Announcements. 7.45, La Fornarina—Operetta in Three Acts (Lombardo). In the intervals, Book Review and Announcements. After the Operetta, Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Duets on Gramophone Records. 7.15, Le Journal Parlé. 7.30, Gramophone Music. 7.50, Talk: The Event of the Week. 8.0, Theatre Talk. 8.30, Concert. 9.20, Dance Music. 11.0, News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (contd.). 7.45, Gramophone Music. 8.0, News. 9.30, Concert by the Paris Concert Society, relayed from the Conservatoire. The Orchestra

conducted by Philippe Gaubert and the Paris Mixed Choir, conducted by de Ranse. Soloists: Mmes. Malnory, Marseillac and Montfort, M. Rambaud, Narcon, Merckel and Jacob. Mass in D for Soloists, Choir, Orchestra and Organ (Beethoven). Le Déluge (Saint-Saëns). **12 Noon,** Gramophone Concert. Part I—Mandoline and Accordion Music. Autour du moulin (Feret); Colombinella (Delubre-Dumestre); Minnet from Le bourgeois gentilhomme (Lully-Feret); Crépuscule (Bianco); Arlequin et Colombine (Lacôme); Nostalgia (Pizarro); Waltz, España (Waldteufel); Marche des Accordeonistes (Marceau). Part II—Light Music. In the interval at **1.0 p.m.,** Exchange, News and Weather, and at **1.30,** Exchange. **2.0,** Exchange. **3.0,** Programme for Children. **3.45,** Exchange and Market Prices. **6.20,** Agricultural Talk. **6.45,** Gramophone Music. **7.0,** Scientific Talk. **7.20,** Gramophone Music: Waltz, Gold and Silver (Lehár); Bouton d'or (Pierné-Yatove); Piccolo (O. Straus). **7.30,** Gramophone Records: Romanian Dance (Bela Bartok); Tes beaux doigts roses (Cazals); Maria Mari (di Capua); Dans la fumée (Bos); Bells across the Meadows (Ketelbey). **7.45,** Review of the Latin Press. **8.0,** Latvian Independence Day Programme. Talk by Henri Hauser. Address by the Latvian Ambassador, M. Gielens. Latvian Songs by Elsa Guebraut; Latvian Music on Gramophone Records. **9.0,** Song Programme presented by Georges Chepfer. In the interval at **8.45,** Review by René Dorin, and at **9.15,** News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed on **W8XK** on **48.86 metres** and **25.27 metres.—7.0 p.m.,** Musical Originalities, from **New York. 7.30,** Concert Echoes, from **New York. 7.45,** Football Game. **9.30,** Concert Favourites, from **New York. 10.0,** Casino Orchestra, from **New York. 10.30,** A Reereo, Bill and Alex. **10.45,** Orphan Annie, from **New York. 11.0,** News, Pat Haley. **11.15,** Sports and Programme Preview. **11.30,** Evensong. **11.45,** Iznak Walton League. **12 Midnight,** Happy Felton's Orchestra. **12.30 a.m. (Sunday),** Programme to be announced. **12.45 to 3.0, New York** Relay. **12.45,** Annie, Judy and Zeke. **1.0,** Waldorf Astoria Orchestra. **1.30,** Sous les Ponts de Paris. **2.0,** Jamboree. **3.0,** Behind the Law.

PORSGRUND.—See **Oslo.**

POZNAN

897 kc/s, 334.4 metres; 1.9 kW.—**6.10 p.m.,** Programme Announcements. **6.15,** Programme from **Warsaw. 9.0,** Talk. **9.15,** Time Signal and Sports Notes. **9.25,** See **Warsaw. 11.0** (approx.), Close Down.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Bratislava. 3.30,** Addresses in Celebration of the Fiftieth Anniversary of the Prague National Theatre, relayed from the National Museum. **4.0,** Talk for Young People. **4.15,** Talk on Commerce. **4.25,** Gramophone Music. **4.35,** Czech Lesson for German Listeners. **4.50,** Gramophone Music. **5.5,** Agricultural Notes. **5.15,** Theatre Talk. **5.25,** News in German. **5.30,** German Transmission—Cabaret Programme. **5.50,** News and Weather. **5.55,** Talk on the following Transmission. **6.0,** Libussa—Opera in Three Acts (Smetana) relayed from the National Theatre on its Fiftieth Anniversary: Conductor: Otakar Ostrcil. Talk in the interval. **9.40,** News and Sports Notes. **9.55,** See **Moravska-Ostráva. 10.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW; and **Geneva, 400 kc/s, 749.9 metres.—6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Geneva**), Sports Notes, Tourist Report, Answers to Correspondence and Financial Notes. **12 Noon** (from **Geneva**), Gramophone Concert. **1.0 p.m.,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0** (from **Lausanne**), Concert by the Small Radio Lausanne Orchestra, conducted by Moser. **3.45,** Concert relayed from **Lugano. 5.0** (from **Geneva**), Programme for Children. **5.20** (from **Geneva**), Programme for Young People. **5.40** (from **Geneva**), Film Talk. **6.5** (from **Geneva**), Talk: The Aluminium Industry. **6.30** (from **Geneva**), Radio Chronicle. **7.0** (from **Geneva**), Concert of Chamber Music by the Wind Instrument Society: Wind Instrument Quintet (Haydn); Rhapsody for Wind Instruments and Pianoforte (Jongen). **7.40** (from **Geneva**), Weekly Gazette. **7.50,** Concert of Light Music by the Radio Suisse Romande Orchestra, conducted by Echenard: Overture, The Bohemian Girl (Balfe); Ballet Music from The Cid (Massenet); Waltz, Dolores (Waldteufel); Two Syncopated Pieces (Coates); Mascarade (Lacôme). **8.50,** News and Weather. **9.0** (from **Geneva**), Talk: The Work of the League of Nations. **9.30** (from **Geneva**), Dance Music on Gramophone Records. **10.30** (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**8.10 p.m.,** Weather. **8.20,** Musical Programme and Announcements. **8.35,** Programme to be announced. **9.0,** Chimes and Concert by the Station Trio. **9.30,** Reading. **10.0,** News. **10.30,** Choral Music on Gramophone Records, followed by Dance Music. **1.0 a.m. (Sunday),** Close Down.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**5.30 p.m.,** Gala Concert of Latvian Music, conducted by Leonids Vigners. Dramatic Overture (Vitols); Suite No. 2 (Medins); Extracts from the String Quartet (Vitols); Canzonetta (Medins); Latvian Dance Suite (Darzins). **6.30,** Reading. **7.0,** News. **7.20,** The Garden of the Sun—Cantata (Aleksandro Valle); by the Station Orchestra, conducted by the Composer, the Rota Choir, Mirdza Bajars (Soprano) and Ozolitis (Baritone). **7.50,** Ballads. **8.0,** Weather and News. **8.15,** On the Banks of the Daugava—Symphonic Poem (Aleksandro Valle), by the Station Orchestra, conducted by the Composer. **8.30,** Ballads. **8.45,** Popular Latvian Songs.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres** from **7.45 p.m.;** and **2RO.—12 Noon to 1.15 p.m.,** Orchestral Concert. In the intervals at **12.30,** Giornale Radio, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.55,** GiornaleRadio and Report of the Royal Geographical Society. **4.10,** Weather. **4.15,** Orchestral Concert: Potpourri; Danse macabre (Saint-Saëns); Valzer all'antica (Barzizza); Berceuse (Respighi); Rataplan (Penna); Un'altra volta (Vidale); Marcia selvaggia (Floridia); Melody (Knight). **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Morse Signals and Dopolavoro Announcements. **6.0,** Tourist Report. **6.10,** Agricultural Notes and Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time, Announcements and Gramophone Music. **7.15,** Three Songs of the Abruzzi—Soprano and Bass Duets by Maria Baratta and G. Bandini. **7.30,** Giornale Radio and Sports Notes. **7.45,** Talk: An Adventure with a tribe of Gipsies. **8.0,** Relay of an Opera from a Theatre. In the intervals, Talk and Theatre Notes. After the Opera, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XQAD** on **19.56 metres.—7.30 p.m.,** Football Game. **12.45 a.m. (Sunday),** Stock Reports. **1.0,** Popular Programme. **1.30,** Antobal's Cubans, from **New York. 1.45,** Popular Programme. **2.0 to 4.0, New York** Relay. **2.0,** Baron Münchhausen, Comedian. **2.30,** Leo Reisman's Orchestra, Four Yacht Club Boys. **3.0,** Saturday Night Dancing Party. **4.0,** Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **11.0** (from **Berne**), Song Recital on Gramophone Records. **11.29,** Time Signal from Neuchâtel Observatory, Weather, and News. **11.40** (from **Berne**), Talk: The Week in the Federal Assembly. **11.50** (from **Berne**), Light Music on Gramophone Records. **12.15 p.m.** (from **Berne**), Song Recital. **12.25** (from **Berne**), Time, Weather and Exchange. **12.30** (from **Zürich**), Request Gramophone Records. **12.45** (from **Zürich**), Book Review. **1.15** (from **Zürich**), Gramophone Concert. **1.45** (from **Zürich**), Educational Talk. **2.0,** Interval. **2.59,** Time Signal from Neuchâtel Observatory. **3.0** (from **Berne**), Talk with Gramophone Illustrations: Latvian Folk Songs. **3.45,** Concert relayed from **Lugano. 5.0** (from **Basle**), Opera and Operetta Music on Gramophone Records. **5.30** (from **Basle**), Talk: Swiss Water-ways. **6.0,** Chimes from Zürich Churches. **6.15** (from **Basle**), Time, Weather and Market Prices. **6.20,** Gramophone Music. **6.30** (from **Basle**), Talk: Hieronymus Hess, a Basle Painter of the Early Nineteenth Century. **7.0** (from **Basle**), Choral Concert, conducted by Ernst Sigg, relayed from St. Elizabeth's Church. **8.15** (approx.), Weather and News. **8.25** (from **Basle**), Cabaret Programme. **10.0** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc-s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 225.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746 metres;** and **Sundsvall, 554 kc/s, 542 metres.—3.0 p.m.** (from **Göteborg**), Light Orchestral Concert: Slav March (Neruda); Hofballtänze (Lanner); Overture, Fra Diavolo (Auber); Selection from Fedora (Giordano); Liebesträume (Liszt); Selection from Rose Marie (Friml). **4.5** (from **Boden**), Programme for Children. **4.30,** Radio Report. **4.45,** Gramophone Music. **5.45,** Talk: Spain. **6.15,** Weather and News. **6.30,** Old Dance Music by the Sven Skolds Orchestra. **7.0,** A Visit with the Microphone. **7.45,** Military Band Concert conducted by Ivar Widner: March, Alt Berlin (von Blon); Polonaise (Svendsen); Scènes alsaciennes (Massenet); Serenade, Avant de mourir (Boulanger); Selection from The Flower of Hawaii (Abraham); March (Austin). **8.45,** Weather and News. **9.0,** Modern Dance Music. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Light Music on Gramophone Records. **12.15 p.m.,** Gramophone Concert of Variety Music. **12.45,** News. **1.0,** Time. **1.1,** Song and Pianoforte Recital by Louise Debonte and Othon Wetzel: Seven Pianoforte Solos (Debussy): (a) Reflets dans l'eau, (b) Five of Les préludes, (c) Bruyères, (d) La pernto del Vino, (e) La terrasse des audiences du clair de lune, (f) Minstrels, (g) Les collines d'Anacaprie; Songs: Three Ballads of François Villon (Debussy); Pianoforte: Valses nobles et sentimentales (Ravel); Three New Ballads (Gaubert); Pianoforte: Ondine (Ravel). **2.0,** Legal Talk in German. **2.15,** Gramophone Concert of Light Music. **3.0,** Talk on Music. **3.15,** Interval. **4.0,** Gramophone Concert of Variety Music. **5.0,** Symphony Concert by the Pasdeloup Concert Society, relayed from **Paris. 7.0,** French Elocution Lesson. **7.15,** Gardening Talk in German. **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German, Lottery Results and Announcements. **8.30,** Dramatic Programme: (a) Scènes de la vie de Bohème—Play (Henry Murger), arranged for Radio by Sylvain Bloch, (b) Le prix du micro—Radio Sketch (Henri Farémont). In an interval at **9.30** (approx.), Press Review. **10.30,** Dance Music, relayed from the Savoy. **12 Midnight** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.—11.0 a.m.,** Programme from **Frankfurt. 12.25 p.m.,** Local News and Weather. **12.35 to 2.10,** Morse Lesson. **2.30,** Zither and Accordion Recital by Heinz Mönch and Fritz Mühlfenzl. **3.0 to 5.0,** See **Langenberg. 5.0,** See **Frankfurt. 5.35,** Talk: The River Neckar. **5.50,** Time and Agricultural Notes. **6.0,** Transmission for all German Stations relayed from **Langenberg. 7.0,** See **Frankfurt. 7.10,** Bunter Abend relayed from **Ulm. 9.0,** See **Frankfurt. 9.20,** What you should know. . . . **9.30,** Local News, Weather and Sports Report. **9.45,** See **Frankfurt. 10.0,** See **Berlin (Deutschlandsender). 10.10,** See **Frankfurt. 11.0,** Serenade. **1.0 a.m. (Sunday),** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Accordion Music. **6.30,** Extracts from Sound Films. **6.45,** Operetta Music. Selection from: (a) La fille de Madame Angot (Lecocq), (b) A Waltz Dream (O. Straus); Overture, The Countess Maritza (Kálmán). **6.55,** Medical Talk. **7.15,** News and Exchange. **7.30,** Overture, Leonora (Beethoven), by the Symphony Orchestra. **7.45,** Opera Music. Selection from Le roi malgré lui (Chabrier); Aria from Werther (Massenet); Aria from Thaïs (Massenet); Siciliana from Cavalleria rusticana (Mascagni). **8.0,** Orchestral Music. **8.15,** Chansonnettes. **8.30,** Light Music. **8.45,** Military Music. **9.0,** Concert: Part I. Operetta Music. Tyrolienne from La belle Hélène (Offenbach); Pastoral Song from Brummel (Hahn); Air from Mam'zelle Nitouche (Hervé); Songs from Le jour et la nuit (Lecocq), Ciboulette (Hahn); Le grand Mogol (Audran); The Count of Luxembourg (Lehár); Rip (Planquette); Véronique (Messager). Part II: Orchestral Music. **10.0,** Opera Music. Arias from Hamlet (Thomas); Sigurd (Reyer), and The Magic Flute (Mozart); Melody for Voice and Orchestra from Scheherazade (Ravel). **10.15,** News. **10.30,** Concert for Listeners in Morocco. Part I: Recital by a Cinema Organ. Part II: Light Music. **11.15,** Dance Music. **12 Midnight,** News. **12.5 a.m. (Sunday),** Chansonnettes. **12.15,** Orchestral Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—4.10 p.m.,** Chamber Concert: Nina (Pergolesi); The Nightingale in Love (Couperin); Liebestraum (Liszt-Schipa); Orientale (Cui); Arabesque (Debussy); Adagio from the Quartet in F (Paribeni); Arvr (Paul Quon); Quartet in E minor (Smetana). **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Lottery Results, Dopolavoro Notes and Gramophone Music. **6.0,** Time, Tourist Talk and Gramophone Music. **6.10,** Market Prices. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** News. **7.25,** Talk: Events and Problems. **7.45,** An Operetta in Three Acts. In the interval, Book Review and Talk. After the Operetta, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10. to 10.15 a.m.,** Religious Announcements in Various Languages. **7.0 to 7.15 p.m,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kcs, 218.5 metres.—11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. In the interval at **12 Noon,** Time, Weather and Announcements. **1.0 p.m.,** Interval. **2.0,** Time, Weather and Exchange. **2.15,** Italian Conversation. **2.40,** The Princess who could not sleep—Play for Children (Bockelmann). **3.20,** Concert by the Vienna Zither Quartet: Mareh, Heil Aschach (Fux); Waltz, Frauenzauber (Altmann); Am Scheidewege (Slezak); Plaudereien vorm Jägerhaus (Nikl); Styrian Melodies (Nikl); March, Frei und Treu (Pröll). **3.50,** Talk with Gramophone Records: In Bulgarian Villages. **4.20,** Gramophone Concert. **5.35,** Monthly Review of Foreign Affairs. **6.5,** Song Recital by Armand Tokatyan: Vaghissima Sembianza (Donandy); L'ultima canzone (Tosti); Serenata (Toselli); Elegie (Massenet); French Serenade (Leoncavallo); Mattinata (Leoncavallo); Lolita (Buzzi-Peccia); Goin' Home (Dvorák); Mountains (Rasbach); To a Messenger (La Forge); Pecché (Pennino); Maria mari (di Capua); Tarantella sincera (di Crescenco). **7.0,** Time, Weather, Sports Report and Programme Announcements. **7.10,** To-day's Motto. **7.15,** The Wine Festival—a Sound Film Sequence with Commentary. **8.15,** News. **8.30,** Concert by the Mayrecker Quartet and Soloists, in Aid of the St. Elizabeth Charitable Society, relayed from the Steinsaal, with Talk. **9.40,** Dance Music on Gramophone Records. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5,** Dance Music by the Wilkosz Orchestra. In the interval at **11.30,** Radio Journal and Weather Report. **12 Noon,** Interval. **2.30 p.m.,** Economic Notes. **2.40,** Answers to Correspondence. **2.55,** Aviation Report and Anti-Gas Drill. **3.0,** Programme for Invalids, relayed from **Lwów. 3.40,** French Lesson. **3.55,** Duets from Opera on Gramophone Records. **4.15,** Organ Recital relayed from **Lwów. 4.50,** Gardening Notes. **5.0,** Talk. **5.20,** Gramophone Music. **5.35,** Miscellaneous Items. **5.55,** Recitation. **6.10,** Programme Announcements. **6.20,** Programme for the Fifteenth Anniversary of the Latvian Republic. The Station Symphony Orchestra, conducted by Szulc. Soloists: Puknas-Trawena (Soprano), and Burkath (Pianoforte). Speech by the Latvian Minister, M. P. O. Groswald. Polish Translation of the Speech. Latvian and Polish National Anthems. Four Pieces (Wihtols): (a) Symphonic Poem, The Feast of Lihо, (b) The King Brusubaud and the Princess Hundega, (c) Seene, (d) Bourrée; Latvian Songs; Pianoforte Solos: (a) Theme with Variations, Op. 6 (Wihtols), (b) Two Etudes (Wihtols); Latvian Songs; Suite (Medins). **7.50,** Radio Journal. **8.0,** Answers to Correspondence. **8.15,** Chopin Concert. Paltt (Soprano), Wilkomirska (Pianoforte), Wilkomirski (Cello). 'Cello Sonata in G Minor, Op. 65; Songs. **9.0,** Talk in French: The Fifteenth Anniversary of the Polish Renaissance. **9.15,** Sports Notes. **9.25,** Dance Music, relayed from the Gastronomia Café. In the interval at **10.0,** Aviation Weather Report and Police Notes.

WILNO

530 kc/s, 566 metres; 16 kW.—**6.10 p.m.,** Programme for Students. **6.20,** See **Warsaw. 9.0,** Talk. **9.15** till Close Down, See **Warsaw.**

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—**6.25 p.m.,** Talk. **6.45,** Announcements and News. **7.15,** Concert by the Radio Orchestra. Soloist: Stjepan Ivelja (Tenor). **8.45,** Dance Music. **9.0,** News, Weather, and Programme Announcements. **9.15,** Dance Music. **10.0** (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender.**

NOV. 18th SATURDAY *continued*

PRINCIPAL BROADCASTING STATIONS OF EUROPE

Arranged in Alphabetical Order

(Stations with an aerial power of 50 kW. and above in heavy type)

Station.	Tuning Positions.	Metres.	Kc.	kW.
Aberdeen		214.3	1400	1
Agen (France)		453.2	662	0.25
Älesund		447.1	671	0.35
Algiers (Algeria)		363.6	825	13
Almeria, EAJ18 (Spain)		252	1193	1
Ankara (Angora) (Turkey)		1538	195	7
Athlone (Irish Free State)		413	725	60
Augsburg (Germany). (*Relays Munich*)		560	536	0.25
Baku, RV8 (Russia)		1260	238	10
Barcelona, EAJ1 (Spain)		348.8	860	7.6
Barcelona, EAJ15 (Assoc. Nat.) (Spain)		252	1193	1
Bari (Italy) (*Relays Rome*)		269.8	1112	20
Basle (Switzerland). (*Relays Beromünster*)		244.1	1229	0.5
Belfast (N. Ireland)		242.3	1238	1
Belgrade (Yugoslavia)		430.4	697	2.5
Bergen (Norway)		364.1	824	1
Berlin, Funkstunde (Germany)		419.5	715	1.5
Berlin (Deutschlandsender). *See* **Zeesen**		1635	183.5	60
Berlin. (*Relay Station*)		283.6	1058	0.5
Berne (Switzerland). (*Relays Beromünster*)		245.9	1220	0.5
Beromünster (Schweizerischer Landessender) (Switzerland).		459.4	653	60
Béziers (France)		219.9	1365	1.5
Boden (Sweden). (*Relays Stockholm*)		1229.5	244	0.6
Bodö (Norway)		453.2	662	0.5
Bolzano (Italy)		368.1	815	1.0
Boras (Sweden)		207	1450	0.15
Bordeaux Lafayette, PTT (France)		304	986	13
Bordeaux, Sud-Ouest (France)		237.2	1265	3
Bournemouth. (*Relay Station*)		288.3	1040	1
Bratislava (Czechoslovakia)		278.8	1076	13.5
Bremen (Germany). (*Relays Hamburg*)		227.4	1319	0.25
Breslau (Germany)		325	923	60
Brno (Brunn) (Czechoslovakia)		341.7	878	35
Brussels No. 1, Velthem (Belgium). (*French Programme.*)		509	589	15
Brussels II, Velthem (Belgium). (*Flemish Programme.*)		338.2	887	15
Bucharest (Roumania)		394.2	761	12
Budapest (Hungary)		840	357	18.5
Budapest No. 1, Lakihegy (Hungary)		550	545	18.5
Cadiz (Spain)		335	896	5
Cassel (Germany). (*Relays Frankfurt*)		259.3	1157	0.25
Copenhagen (Denmark)		281.2	1067	0.75
Cork (Irish Free State)		224.4	1337	1
Cracow (Poland)		312.8	959	1.7
Danzig. (*Relays Heilsberg*)		447.1	671	0.5
Daventry National		1554.4	193	30
Dresden (Germany). (*Relays Leipzig*)		318.8	941	0.25
Eiffel Tower, FL, Paris		1446	207.5	13
Eskilstuna (Sweden)		245.9	1220	0.2
Falun (Sweden)		307	977	0.5
Fécamp, Radio-Normandie (France)		225.9	1328	10
Flensburg (Germany). (*Relays Hamburg*)		227.4	1319	0.5
Florence, IFI (Italy). (*Relays Turin*)		500.8	599	20
Frankfurt-a.-M. (Germany)		259.3	1157	17
Fredriksstad (Norway). (*Relays Oslo*)		368.1	815	0.7
Freiburg-im-Breisgau (Germany). (*Relays Mühlacker.*)		570	527	0.25
Galicia, EAJ4 (Spain)		368.1	815	0.2
Gävle (Sweden)		204.1	1470	0.2
Geneva (Switzerland). (*Relays Sottens*)		760	395	1.3
Genoa, IGE (Italy). (*Relays Turin*)		312.8	959	10
Gleiwitz (Germany). (*Relays Breslau*)		253.1	1185	5
Göteborg (Sweden). (*Relays Stockholm*)		321.9	932	10
Graz (Austria). (*Relays Vienna*)		352.1	852	7
Grenoble (France)		568.1	528	2
Halmstad (Sweden)		215.6	1391	0.2
Hälsingborg (Sweden)		201.3	1490	0.25
Hamar (Norway). (*Relays Oslo*)		575	521.5	0.7
Hamburg (Germany)		372.2	806	1.5
Hanover (Germany). (*Relays Hamburg*)		227.4	1319	0.25
Heilsberg (Germany)		276.5	1085	60
Helsinki (Finland). (*Relays Lahti*)		368.1	815	10
Hilversum (Holland). (*7 kW before 4.40 p.m.*)		296.1	1013	20
Hörby (Sweden). (*Relays Stockholm*)		257.1	1167	10
Hüdiksvall (Sweden). (*Provisional*)		222.9	1346	0.15
Huizen (Holland). (*Kootwyk 50 kW after 3.40 p.m.*)		1875	160	8.5
Innsbruck (Austria). (*Relays Vienna*)		283.6	1058	0.5
Juan-les-Pins, Nice (France)		249.6	1202	0.8
Kaiserslauten (Germany). (*Relays Munich*)		560	536	1.5
Kalmar (Sweden)		247.7	1211	0.2
Kalundborg (Denmark). (*Relays Copenhagen*)		1154	260	60
Karlskrona (Sweden)		195	1530	0.2
Karlstad (Sweden). (*Relay Station*)		230.6	1301	0.25
Katowitz (Poland)		408.7	734	16
Kaunas (Kovno) (Lithuania)		1935	155	7
Kharkov, RV4 (Russia)		938	320	20
Kharkov, RV20 (Russia)		368.1	815	10
Kiel (Germany). (*Relays Hamburg*)		232.2	1292	0.25
Kiev, RV9 (Russia)		1035	290	36
Klagenfurt (Austria). (*Relays Vienna*)		453.2	662	0.5
Königsburg (East Prussia). (*Relays Heilsberg*)		217	1382	0.5
Kosice (Czechoslovakia)		293.5	1022	2.6
Kristiansand (Norway)		235.5	1274	0.5
Kristineham (Sweden)		202.7	1480	0.25
Lahti (Finland)		1796	167	40
Langenburg (Germany)		472.4	635	60
Lausanne (Switzerland). (*Relays Sottens*)		680	441.2	0.6
Leipzig (Germany)		389.6	770	120
Leningrad (Russia)		857	350	100
Leningrad, RV70 (Russia)		348.8	860	10
Lille, PTT (France)		265.8	1128.5	1.3
Limoges, PTT (France)		293.5	1022	0.7
Linz (Austria). (*Relays Vienna*)		245.9	1220	0.5
Lisbon CT 1AA (Portugal). (*Short-wave Station on 31.25 m.*)		282.2	1063	2
Ljubljana (Yugoslavia)		574.7	522	7
Lodz (Poland). (*Relay Station*)		235	1283	1.65
London National (Brookmans Park)		261.5	1147	50
London Regional (Brookmans Park)		355.9	843	50
Luxembourg		1190	252	200
Lwow (Lemburg) (Poland)		381	788	16
Lyons (Radio-Lyon) (France)		284.8	1053	0.7
Lyons la Doua, PTT (France)		465.8	644	1.5
Madona (Latvia). (*Relays Riga*)		451.8	664	20
Madrid, EAJ7 (Union Radio). (*After 7.0 p.m.*)		424.3	707	2
Magdeburg (Germany)		283.6	1058	0.5
Magyarovar (Hungary)		209	1430	1.25
Malmö (Sweden). (*Relay Station*)		230.6	1301	1.25
Marseilles, PTT (France)		315.8	950	1.6
Midland Regional		398.9	752	25
Milan (Italy). (*Relays Turin*)		331.5	905	50
Milan (Vigentino) (Italy). (*Relays Rome*)		453.2	662	4
Minsk Koloditschi, RV10 (Russia)		1105	271.5	35
Miskole (Hungary)		209.8	1430	1.25
Monte Ceneri (Switzerland)		1154	260	20
Montpellier (France)		286	1049	0.8
Moravska Ostrava (Czechoslovakia)		263.8	1137	11.2
Moscow, Imini Stalina (Russia)		424.3	707	100
Moscow, RV39 (Russia). (*S.-W. Stn. on 50 m.*)		1000	300	100
Moscow, RV2 (Experimental) (Russia)		720	416.6	20
Moscow, Popoff RV58 (Russia)		1117	268.5	40
Moscow, RV1 (Old Komintern) (Russia)		1481	202.5	500
Moscow, WZSPS (Trade Union) (Russia)		1304	230	100
Motala (Sweden). (*Relays Stockholm*)		1348	222.5	30
Mühlacker (Stuttgart) (Germany)		360.6	832	60
Munich (Germany)		533	563	60
Naples, INA (Italy). (*Relays Rome*)		318.8	941	1.5
Newcastle		211.3	1420	1
Nimes (France)		233	1260	1
Norrköping (Sweden). (*Relay Station*)		230.6	1301	0.25
North National (Manchester)		301.5	995	50
North Regional (Manchester)		480	625	50
Notodden (Norway). (*Relays Oslo*)		447.1	671	0.08
Novosibirsk, RV6 (Russia)		1380	217.5	100
Nürnberg (Germany). (*Relays Munich*)		238.9	1256	2
Nyireghaza (Hungary). (*Relays Budapest*)		267.4	1122	6.25
Odessa, RV13 (Russia)		450.4	666.7	10
Ornsköldsvik (Sweden)		206	1460	0.2
Oslo (Norway)		1083	277	60
Ostersund (Sweden). (*Relays Stockholm*)		770	389	0.6
Oulu (Uleaborg) (Finland)		690	434.6	1.5
Palermo (Italy)		537.6	558	3
Paris, Ecole Supérieure PTT		447.1	671	7
Pecs (Hungary)		209.8	1430	1.25
Petrozavodsk, RV29 (Russia)		779	385	10
Pietarsaari (Finland)		245.9	1220	0.5
Plymouth		218.5	1373	1.5
Pori (Finland)		453.2	662	1
Porsgrunn. (*Relays Oslo*)		453.2	662	0.7
Poste Parisien (France)		328.2	914	60
Poznan (Poland)		334.4	897	1.9
Prague (Czechoslovakia)		488.6	614	120
Rabat (Morocco)		416.4	720.5	5

PRINCIPAL BROADCASTING STATIONS OF EUROPE

(In Alphabetical Order)

Station.	Tuning Positions.	Metres.	Kc.	kW.
Radio, LL, Paris		370.1	810.5	0.8
Radio Paris, C.F.R.		1725	174	75
Radio Vitus (Paris). (*S.-W. Stn. on 43.75 m.*)		307	977	0.7
Rennes, PTT (France)		271.5	1105	1.3
Reykjavik (Iceland)		1200	250	21
Riga (Latvia)		525	571	15
Rjukan (Norway)		447.1	671	0.15
Rome, 1RO. (*S.-W. Stn., 2RO, on 25.4 m.*)		441.2	680	50
Säffle (Sweden). (*Relays Stockholm*)		245.9	1220	0.4
Salzburg (Austria). (*Relays Vienna*)		218.5	1373	0.5
Samara, RV16 (Russia)		575	521.5	1.2
San Sebastian, EAJ8		453.2	662	0.6
Scottish National (Falkirk)		288.3	1040	50
Scottish Regional (Falkirk)		376.4	797	50
Seville, EAJ5 (Union Radio) (Spain)		368.1	815	1
Sofia (Bulgaria)		318.8	941	0.5
Sottens (Radio Suisse Romande) (Switzerland)		403.8	743	25
Stalino, RV26 (Russia)		385.1	779	10
Stamboul (Turkey)		1200	250	5
Stavanger (Norway)		240.6	1247	0.5
Stettin (Germany)		253.6	1055	0.5
Stockholm, SASA (Sweden)		435.4	689	55
Strasbourg, PTT (France)		345.2	869	11.5
Sundsvall (Sweden). (*Relays Stockholm*)		542	554	10
Sverdlovsk, RV5 (Russia)		825	363.6	50
Tallinn (Esthonia)		298.8	1004	11
Tampere (Finland). (*Relays Helsinki*)		558.6	537	1
Tashkent, RV11 (Russia)		1170	256	25
Tiflis, RV7 (Russia)		1071	280	35
Toulouse, PTT (France)		255.1	1176	0.7
Toulouse (Radiophonie du Midi) (France)		385.1	779	8
Trier (Germany). (*Relays Frankfurt*)		259.3	1157	2.3
Trieste (Italy) (*Relays Turin*)		247.7	1211	10
Trollhätten (Sweden)		230.6	1301	0.25
Tromsö (Norway)		453.2	662	0.1
Trondelag (Norway)		495.8	605	1.2
Tunis-Kasbah (Tunisia)		1350	222.2	0.5
Turin (Italy)		273.7	1096	7
Turku (Abo) (Finland). (*Relays Helsinki*)		245.9	1220	0.5
Uppsala (Sweden). (*Relays Stockholm*)		453.2	662	0.15
Valencia (Spain)		267.6	1121	0.75
Varberg (Sweden)		249.6	1202	0.3
Vienna (Bisamberg) (Austria)		517	580	100
Viipuri (Viborg) (Finland). (*Relays Helsinki*)		291	1031	13.2
Warsaw 1 (Poland)		1412	212.5	120
West National (Washford Cross)		261.5	1147	50
West Regional (Washford Cross)		309.9	968	50
Wilno (Poland). (*Relay Station*)		493.4	608	16
Zagreb (Yugoslavia)		307	977	0.75
Zeesen (Königswusterhausen) (Germany). (*S.-W. Stn. DJA on 31.38 m., DJB on 19.73 m., DJC on 49.83 m., DJD on 21.51 m., DJE on 16.86 m.*)		1635	183.5	60

ON THE SPOT

Visits to Foreign Broadcast Stations

XI.—Radio Morocco.

(720.5 kc/s. 416.4 m. 5 kW.)

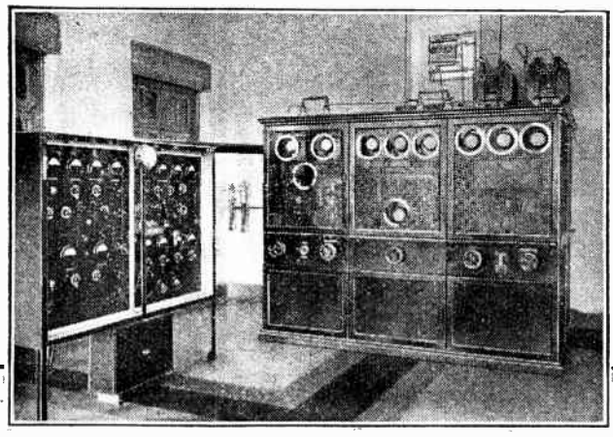
HAVING disappointed a suspicious group of native police who believed me to be a deserter from the French Foreign Legion, I began my journey through the labyrinth of market stalls and menagerie of goats, dogs and sacred bulls in the centre of Rabat, capital of French Morocco, to the studios of Radio Maroc.

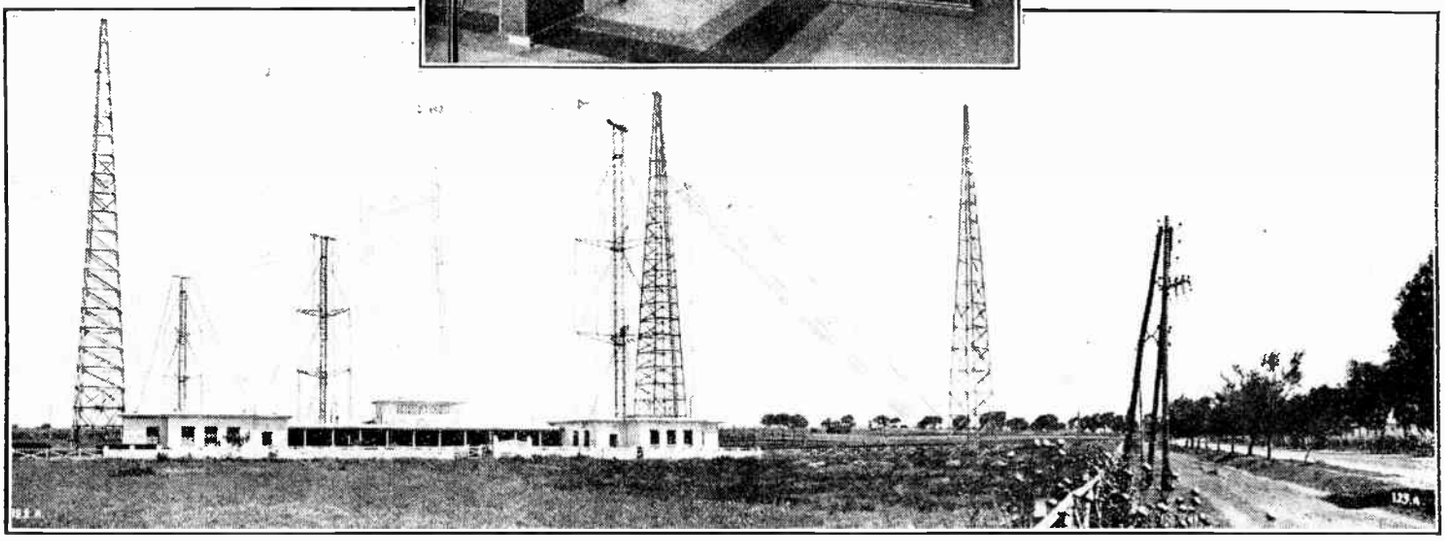
English listeners may be more familiar with the 32.25-metre transmissions on Sunday evenings, but Rabat has also its medium-wave service for an ever-increasing European and Berber populace. Broadcasting in Berber land had its genesis in the 1927 North African Conference, which led to the establishment of radio telephony, and later to broadcasting transmitters at Rabat, Algiers and Tunis. Rabat, I learned, is to be pushed up to 50 kW., Algiers to 75 kW., and Tunis to 60 kW., and all three stations will be interconnected by cable.

Programmes are given in English, French and Arabic. Advertising figures largely in the programmes. Relays are carried out from Casablanca theatres, and I discovered that the station keeps abreast of the times. Among the diversified entertainment are performances of weird, somewhat monotonous, but highly fascinating Eastern music given by the Sultan's own orchestra and by the famous Garde Noire.

I located the transmitters on the fine tarred road from Rabat to Casablanca beyond the crumbling fortress walls of the city. The buildings also house the commercial transmitters. The excellent radio service is testimony to France's successful colonisation of the land of Islam.

"WANDERLUST"





(*Photo by courtesy of the Director, P.T.T. French Morocco.*

RABAT, the well-known Moroccan broadcasting station, is one of a group of French Post Office transmitters on the road from Rabat to Casablanca, seen in the photograph. Above: the 5-kilowatt transmitter at Rabat. Power is soon to be increased to 50 kW.

Broadcast Brevities

By Our Special Correspondent

What a Birthday !

IF those directing the broadcasting programmes in November, 1922, could have looked forward eleven years to November 14th, 1933, I doubt whether they would have been thrilled. The nature study talk on "Winter Moths and Wingless Females" seems to be quite the most exciting item in the Regional programme for that day. Why have the B.B.C. abandoned birthday celebrations? This is the first year they have been omitted.

Miserable Comforters

THE Press generally has been adopting a tone of fatherly reassurance apropos the Lucerne Plan, but I fail to see why. Is it to be expected that there will be no trouble whatever on January 15th when 150 stations not only change their wavelengths, but in many cases share new waves with other transmitters?

I Ask You

If perfect peace and good will were expected the B.B.C. would not be preparing a special pamphlet on the Lucerne Plan for the guidance and comfort of listeners, nor would the engineers be shaking their heads and talking about the possibility of things "settling down" in a few weeks.

Would they, now?

Relay Whispers

ABERDEEN may borrow an exclusive wavelength from another country.

Newcastle is to operate on 209.9 metres until the new North-Eastern transmitter is erected and takes a higher wavelength.

Bournemouth and Plymouth are each to have new transmitters in the near future, and will then work in synchrony on 203.5 metres.

Does Radio Cause Corns ?

EVERY day there is a corn in Broadcasting House which is a source of somewhat sad pride to its owner, Eric Maschwitz. Situated on the middle finger of the right hand, it has been brought about by toil in the wee sma' hours with a fountain pen and stacks of writing paper.

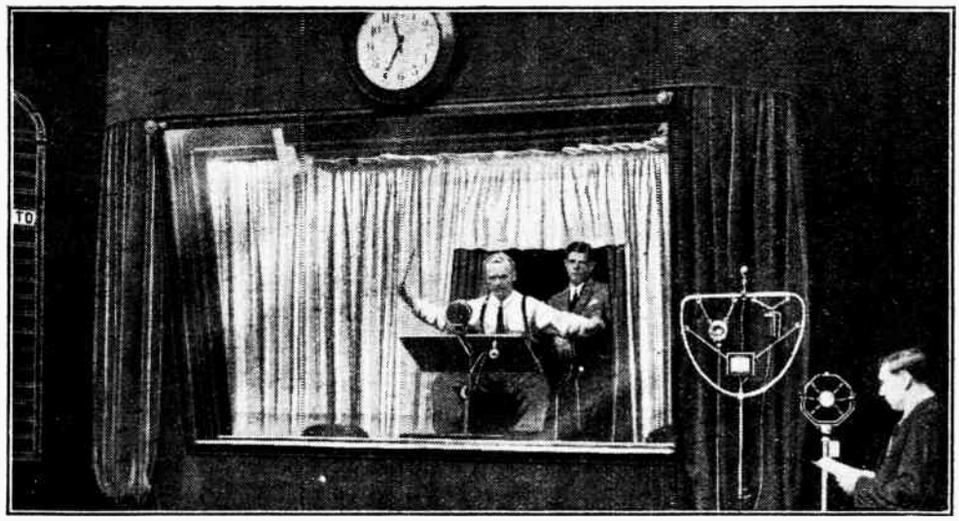
Maschwitz writes everything by hand.

Hard Work

The adaptation of "A Waltz Dream," which provided a delightful broadcast on Tuesday last under the direction of Maschwitz, covered more than a hundred sheets of MS., all in its adaptor's own writing.

A Light in the Window

He is, I believe, the only man who works all day and nearly all night at Broadcasting House. The light in his office can be seen until 4 a.m. or later (charwomen rush in furtively at odd moments to clear the W.P.B.). Just about 4 o'clock he rushes downstairs to the all night buffet and orders a malted milk.



CONDUCTOR AS "LISTENER." Budapest remains the only station in Europe at which the orchestral conductor hears the music just as it comes to the listener on a good set. He is here seen in his sound-proof cabinet. A portion of the silent indicator can be seen on the left

Home, Sweet Home

Home he then goes to get ready to go to the office, and is back again in Portland Place at ten-thirtyish for rehearsals.

This sort of thing has gone on for four months already. And they call him Director of *Variety*.

All the Tit-bits

A NEW feature of the Saturday night programmes starts on November 18th. Entitled "In Town To-night," it will aim to give listeners up-to-the-minute items concerning what is going on in London. Interviews with and broadcasts by notable personages who have only just arrived in town, or who are in the public eye at the moment, tit-bits from new stage performances, new songs, surprise broadcasts, and other material outside the published programme will be included. The "Diversions" of 1930 revived and elaborated.

Broadcasting on the Screen

AT last broadcasting is to be featured on the film screen, and all credit goes to the British Lion Corporation for taking the initiative. Roy Fox and his Band, known to millions of listeners all over the world, are now being filmed at the Beaconsfield studios in the radio musical production "On The Air." Other well-known radio stars in the caste are: Betty Astell, Davy Burnaby, Reginald Purdell, James Carr, Mario de Pietro, Hugh E. Wright, and Eve Beck.

The Announcers' Journal

MRS. BORRETT will leave a memento of her announcing work in the shape of her handwriting in the Announcers' Journal. This interesting diary of broadcasting is kept up hour by hour by the announcers on duty, and some of the entries are as dramatic as they are amusing.

Fainting artistes, mice under the couches, tottering microphones—all these and other phenomena are duly chronicled.

Fun on the Eighth Floor

Strangely enough, the Engineers' Log Book occasionally contains funny items. At 21.40 on 2/10/33 the engineer on duty wrote: "Provincial stations complain of 'dirty background' to weather and second news. This was due to announcer's shirt-front."

On Armistice Day

THE service at the Cenotaph on Armistice Day will this year, for the first time, be broadcast simultaneously to all parts of the Empire. The listener in Vancouver will hear the transmission at 3 a.m., whereas in various parts of Australasia it will be heard at any time between 7 and 10.30 p.m.

The broadcast will start at 10.30 a.m. (G.M.T.), when the Bands of the Grenadier, Coldstream, Irish and Welsh Guards will play such selections as "Hearts of Oak," "The Minstrel Boy," "Land of the Leal," "Skye Boat Song," "When I am Laid in Earth" (Purcell), "Flowers of the Forest," and Chopin's Funeral March.

The Next Big Play

"RED Tabs," the next in the series of great plays in the Radio Drama Festival, is to be heard on December 1st (National) and December 2nd (Regional). This play was written by Val Gielgud, Drama Director of the B.B.C., and first broadcast in October, 1930. It must be unique in post-war literature as a detached discussion of an ethical problem of warfare. The situation faced by General Gore in the play is personal not to him alone, but to every commander of every age, from Thermopylæ to Ypres. 'Red Tabs' is a brief play, clearly argued and free from complications.

Crisp Criticism

"FOR my sins the other night, I listened in to one of the B.B.C. variety performances. Really! Really!"—*Church Times.*

Honour for Stoke

THE Post Office Direction Finding Van will be "at home" in the Stoke district during the next few days, and I am told by those who should know that it will then proceed to make life interesting to the more economically minded listeners at Stafford, Shrewsbury, Oswestry, and Chester.

The investigations will finish up on the first Saturday night in December.

Footnote

PADEREWSKI, the world famous pianist, has agreed to broadcast over the American networks for half an hour for a fee of £2,000.

Harmonic Distortion

A Simple Explanation

By D. A. BELL

WHY distortion is expressed in terms of harmonics, and why amplifiers sometimes give rise mainly to second harmonics, but in other cases produce third harmonics, is fully explained.

THE production of harmonics by an amplifying valve whose characteristic is not strictly linear is such a familiar idea that we rarely stop to ask how these harmonics are produced or how their magnitude may be estimated. The phenomenon may be most easily understood by comparing the wave-forms resulting from certain combinations of harmonics with the distorted wave-forms produced from a simple sine wave by various curved characteristics.

Triodes

Suppose, for example, that we have a fundamental and 5 per cent. of second harmonic with the relative phases shown in Fig. 1. If we take the peak amplitude of the fundamental as 100, the resultant of the fundamental and 5 per cent. of second harmonic will be 95 at A, where they are exactly out of phase, but at the positive peak B, where they are in phase, the amplitude will be 105. Thus 5 per cent. of second harmonic corresponds to a wave which has been distorted so that the amplitudes of its two halves are in the ratio of 105 to 95, or approximately 10 to 9. This gives the rule that for 5 per cent. second harmonics the two valves of the load-line (plotted on the anode current — anode volts diagram) are in the ratio of 10 to 9, for the distances from the operating point of the two ends of the load-line represent the amplitudes of the two peaks on maximum input.

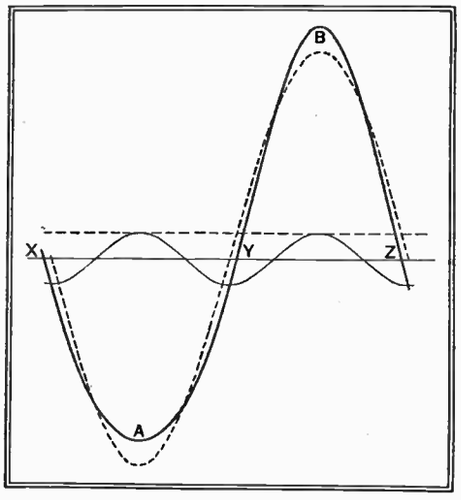
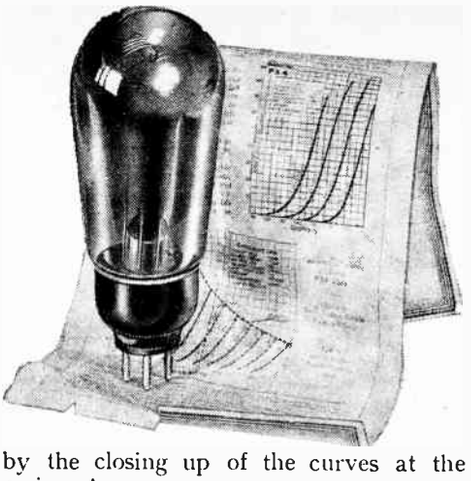


Fig 1.—Second harmonic causes unsymmetrical distortion of the fundamental and may be represented by the addition of a D.C. component which represents some degree of rectification.

In separating the alternating currents from the direct currents in any circuit, an alternating current can be defined as one whose mean value over a whole cycle is zero, since it is alternately positive and negative. All the alternating currents of Fig. 1, therefore, have the same zero line as the fundamental. But the output must be zero whenever the input is zero, and this occurs when the fundamental, which constitutes the whole of the input, crosses the zero line. Since the second harmonic is at its maximum at these points, the only way to satisfy the condition without disturbing the A.C. components is to add a D.C. component, represented by the dotted line in Fig. 1, which will reduce the resultant to zero at the points X, Y, Z. We therefore say that the output consists of fundamental, second harmonic and a D.C. component. This latter can be observed on a milliammeter as an increase in anode current, and is thus used as a test for distortion.

Since a certain amount of direct current has incidentally been produced from an alternating input, this distortion is sometimes called rectification, and it is interesting as a demonstration that any unsymmetrical characteristic must rectify to some extent. Another consideration is the effect of distortion on the power efficiency of the valve. Since power is proportional to the *square* of either voltage or current, and the input must be sufficient to swing up to the larger peak, we take the input power as proportional to 105^2, while the output power is 100^2 of fundamental and 5^2 of second harmonic. In the absence of distortion the output would be 105^2, so that the loss of total power is $105^2 - (100^2 + 5^2)$, which represents 8.86 per cent. In this case the lost power might be thought to be accounted for by the D.C. component, which is of no use in the loud speaker or other load, but it is better regarded from the point of view explained in connection with third harmonics.

With a single triode the load-line is distorted unsymmetrically because of the lower bend in the anode characteristic. But with a pentode both ends of the load-line AOB (Fig. 2) may be cut short, one by the ordinary anode bend and the other



by the closing up of the curves at the region A.

Pentodes

An examination of Fig. 3 shows that a third harmonic represents this effect of reducing both peaks symmetrically, since the harmonic is then always out of phase with the fundamental at the peaks. Hence the distortion produced by a pentode may be mainly third harmonic. Actually the pentode load-line is not exactly symmetrical, so that there may be a certain amount of second harmonic in addition. So far we have only considered the peaks of the wave-form, but it is obvious from the figures that the harmonics will represent changes in the other portions of the wave as well. Consequently, where a simple second or third harmonic represents too much distortion in some parts of the wave, other harmonics of higher order must be introduced to counteract the effect of the lowest harmonics where they are not required; but they will be largely even harmonics in the case of unsymmetrical distortion (triode) and odd harmonics with symmetrical characteristics (pentode, push-pull, etc.). It is usual to assume that in practical amplifiers these higher harmonics are of such small magnitude that they do not appreciably affect the amplitudes of the peaks of the wave-forms.

"Class B" and Q.P.P.

With "Class B" there is some risk of distortion of the middle of the characteristic as well as the ends. For if the valves are under-biased they will both be in action at once for small voltages, and so will over-amplify the middle portion of the wave near the zero line. If, on the other hand, the valves are over-biased, they

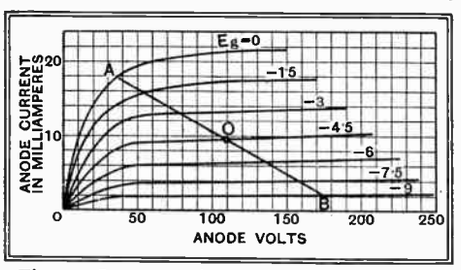


Fig. 2.—In a pentode overloading may occur at both ends of the load line, which restricts both peaks of the fundamental and gives rise to third harmonic distortion.

Harmonic Distortion—

will neither of them function properly on small inputs, and this portion of the wave will be insufficiently amplified. Now in Fig. 3 the third harmonic adds to the fundamental at points near the zero line, so that there is here an increase in the amplification of the part of the wave near the zero line. But we cannot reverse the phase of the third harmonic to represent

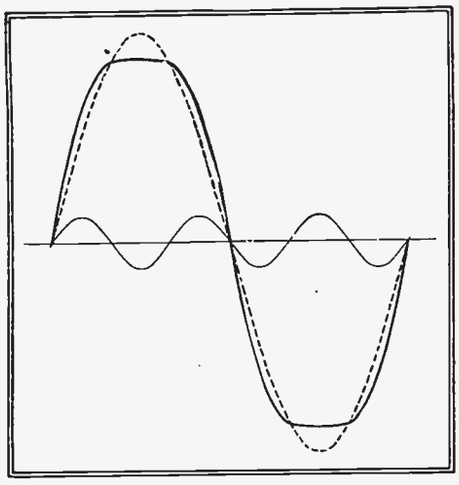


Fig. 3.—The presence of third harmonic reduces both peaks of the fundamental symmetrically. For the sake of clarity the amplitude of the harmonic in this figure and in Fig. 1 has been exaggerated.

a decreased amplification near the zero line, for this would also reverse the effect at the peaks; so, for this case, we must replace some of the third harmonic by fifth harmonic to produce the desired effect. It would be interesting to investigate whether there is any difference in the degree of distortion which will pass unnoticed in the two cases; probably fifth harmonic would be preferable, and in the interests of economy the valves are far more likely to be set for this condition.

With Q.P.P. there will normally be no grid current, so that only the centre of the characteristic, and not the ends, will be distorted. Accordingly we may adjust the phase of the third harmonic to suit the distortion of the middle of the wave, but we must always bring in appreciable amounts of higher harmonics to restore the peaks to their undistorted form. Inaccurate matching, however, will introduce second harmonic by destroying the symmetry.

Since power is proportional to voltage *squared*, the peak of the wave-form has a predominant effect on the power output, and an increase in amplitude at points near the zero line cannot balance an equal decrease at the peaks; consequently, a distortion of the wave-form means that for a given amplitude the power is not the same as it would be with a pure sine wave. With second harmonic we have already found that the output was decreased by the distortion, and with "Class B" it can be shown that 5 per cent. third harmonic caused by curtailing the ends of the load-line results in a power loss of 9.5 per cent. The calculations for Q.P.P. are more complicated, but since the peaks are unaffected by the distortion we may expect the change in power to be small. It is clear from Fig. 3 that the third harmonic is zero whenever the fundamental is zero, so that we require no D.C. component when the distortion is symmetrical, and third harmonic is accompanied by no change in mean current. Consequently, the anode current meter gives no indication of this distortion, and we must rely upon the ear or use an analyser which can measure the amplitudes of the separate A.C. components.

THE B.B.C. OCTOPUS

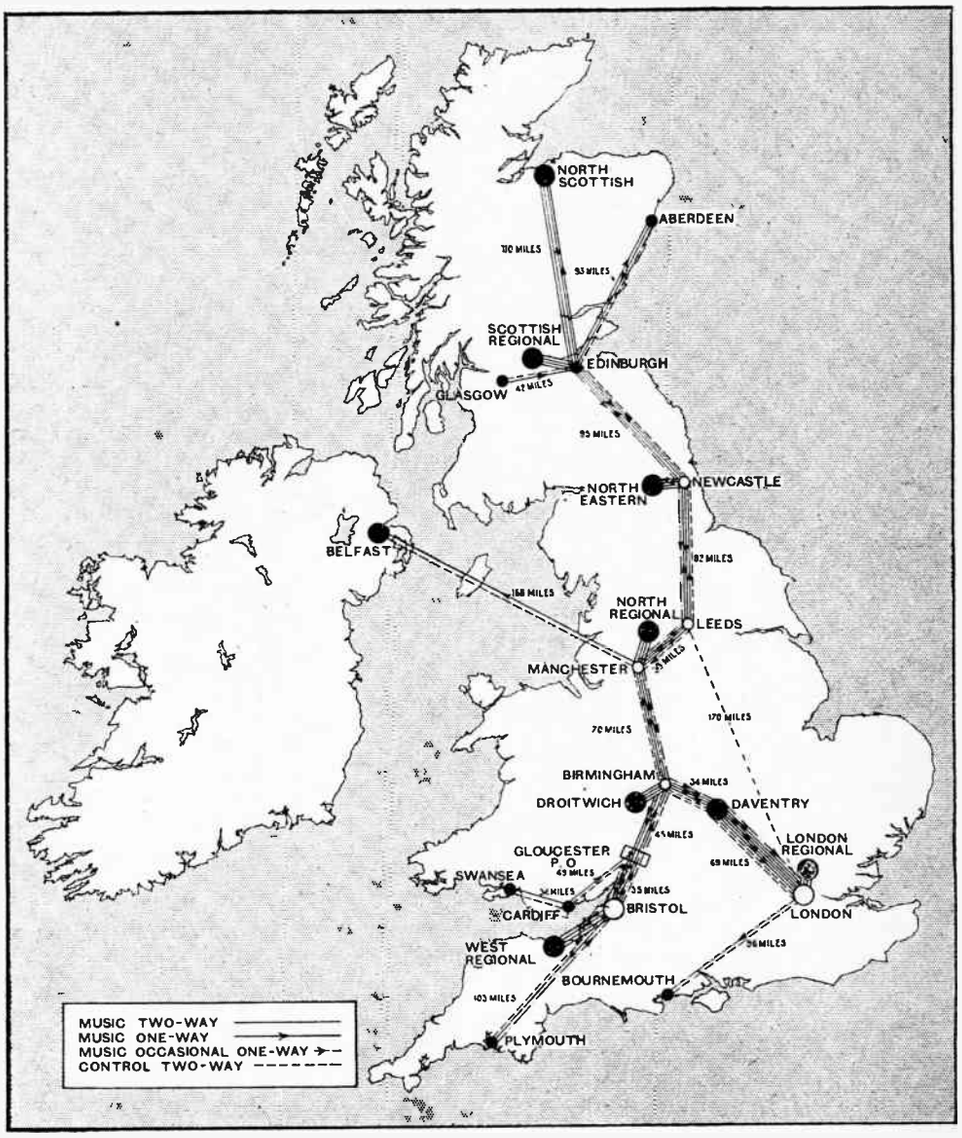
How the New Land Lines are Planned.

LAST week an important transfer of B.B.C. land lines took place, constituting Birmingham, instead of Leeds, as the main exchange between North and South. The accompanying map shows not only the disposition of lines as they are to-day, but includes Droitwich as well as the North Scottish and North Eastern, the two new high-power stations which are expected to be in operation by the summer of 1935.

To supply adequate links between all the B.B.C. transmitters, studios, and repeater points has involved a line mileage of nearly 4,500, practically one and a half times the distance between Liverpool and New York. It is worth noting, however, that these lines are not all available at any given time for B.B.C. purposes.

The B.B.C. leases the lines from the General Post Office, which holds the monopoly of all communication in Great Britain. Certain of the lines are available for broadcasting only at stated times, and in some cases at least a week's notice must be given before the line can be guaranteed available for programme uses.

Between the main centres, however, the lines have been installed exclusively for broadcasting, and these are designed to give a level frequency response between 30 and 8,000 cycles. The average band of frequencies covered is between 30 and 6,500 cycles.



How far do your B.B.C. programmes travel by land line? A glance at the map will answer the question.

Practical HINTS and TIPS

AIDS TO BETTER RECEPTION

THERE can be no doubt that the operation of trimming the tuned circuits of a receiver by aural means is made more difficult by the inclusion of A.V.C. It therefore follows that the use of some simple indicating device, such as an anode current milliammeter, is particularly desirable when this form of control is fitted.

Trimming A.V.C. Sets

Failing a meter, it is generally worth while going to the trouble of making the necessary disconnections in the A.V.C. circuit, so that it may be temporarily out of action while the operation of trimming is being carried out.

This small rectifier unit has been produced by Electradix Radios for use in converting a D.C. voltmeter for reading A.C. (See "Hints and Tips." Sept. 8th.)

WHEN the long days of summer give way to the long nights of winter almost every user of a broadcast set is apt to think that his apparatus is behaving abnormally. At this time of year receivers generally seem to have gained in sensitivity, although to offset this an apparent decline in selectivity is generally noticed.

Seasonal Variations

For both these effects the influence of darkness on the propagation of wireless waves is entirely responsible. Not only do we receive more stations after dark, but, in spite of fading, the average strength of incoming signals from distant transmitters is increased. A foreign station which in daylight will cause no interference may, after dark, be sufficiently strong to spoil the reception of a comparatively near-by transmitter.

Even short-range quality sets are not immune from these effects. Although intelligible interference from distant stations may not be heard, it is quite possible that their carrier waves may be sufficiently strong after dark to cause an audible whistle due to heterodyning of the local station.

Of course, the reason why these effects are so much more noticeable in winter is that most of our listening during that season is done during the hours of darkness.

INSTABILITY in an amplifier of any kind is caused by the feed-back of energy from the output to the input end. The tendency towards instability increases with overall magnification; that is why, in a highly sensitive multi-stage set, meticulous care has to be taken to avoid interaction, both between one stage and another as well as between input and output of H.F. and L.F. amplifiers.

Ganged Condensers

Here we are concerned solely with the H.F. amplifier. Experience shows that instability (or uncontrollable self-oscillation) in modern sets is very often due to the ganged tuning condenser. Although the actual way in which energy is transferred from circuit to circuit through the intermediary of this component is somewhat obscure, a glance at Fig. 1 will suggest that some care should be taken in making the connections to it. In considering this diagram, it is to be understood that the three variable capacities C1, C2 and C3 are actually single sections of a triple condenser, which will therefore be common to all three tuned circuits.

One set of plates (the rotor section) of each condenser is shown as being earthed, and the greatest care must be taken to see that this earthing is done thoroughly, in such a way that there is no resistance or impedance which will be common to two or more circuits. Most definitely, a single earth connection at one end of the condenser frame is not enough; wired in this way, some of the condenser sections will be bound to carry H.F. energy which really belongs to another circuit. Nothing less perfect than two well-made earth connections, one at each end, should be tolerated in a high-gain amplifier.

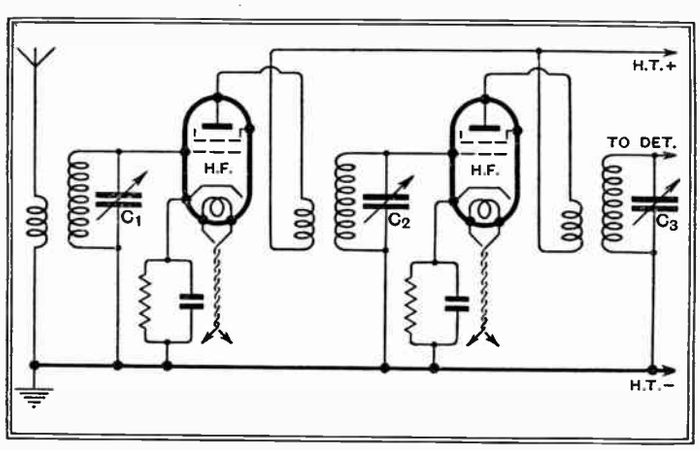
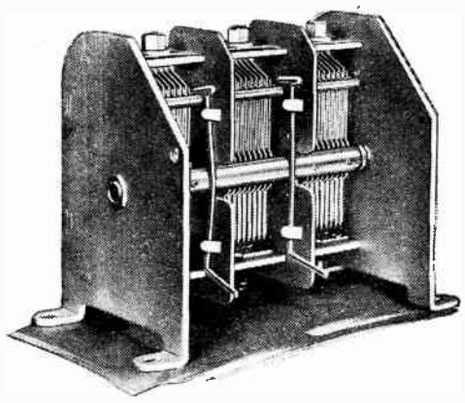


Fig. 1—A simple two-stage H.F. amplifier. The ganged condenser C1, C2, C3 is associated with all three circuits, and is a possible source of interaction unless each rotor section is perfectly earthed.

Further, most modern condensers are fitted with inter-section contact springs bearing on the spindle. When instability is encountered, it will be worth while to remember that the soldering tags on the ends of these springs are for use, and not for ornament; they should be joined directly to earth, preferably near to the cathode terminal of the valve with which the condenser section is associated.



How spindle contact springs are fitted in typical modern condensers.

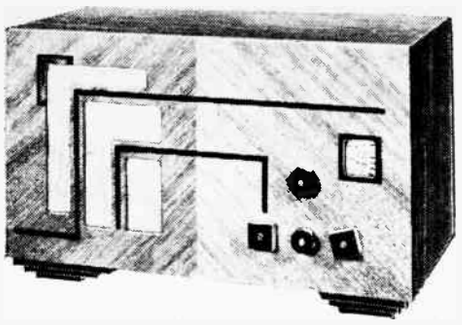
IT has often been advised that the practice should be cultivated of keeping a record of the anode currents of the various valves in a receiver when new, and of checking the figures periodically. By doing this an early indication is obtained of any tendency towards failure of emission; in this matter the measuring instrument is a much more reliable guide than the human ear, for distortion and loss of sensitivity due to ageing of a valve sets in very slowly, and the resulting deterioration of performance is of a kind to which the ear becomes atrophied.

Ageing Valves

Failing emission manifests itself aurally in a number of ways, and, so far as L.F. amplifying valves are concerned, it generally becomes evident through an increased tendency towards early overloading. In certain types of amplifier, particularly those designed for high quality, the use of a valve with low emission may be responsible for severe amplitude distortion of a type which will make the reproduction appear high-pitched. As a general rule, indeed, it may be taken that an apparent over-emphasis of high notes in a receiver which was originally well-balanced is a sign of failing valves.

The Climax Model S4

A Selective Four-valve Superhet



FEATURES. ***Type:—****Table or pedestal model superheterodyne receiver for A.C. mains with moving-coil loud speaker and provision for gramophone pick-up.* ***Circuit:—*** *H.F. pentode det.-osc. — variable-mu I.F. — triode second detector—pentode output valve. Full-wave rectifier.* ***Controls:—****(1) Tuning, with illuminated and calibrated scale. (2) Wave-range and gramo. switch. (3) Volume control. (4) Tone control.* ***Price:—****(with pedestal) 14 guineas.* ***Makers:—****Climax Radio Electric Ltd., Haverstock Works, Parkhill Road, Hampstead, N.W.3.*

THE four-valve superheterodyne class of receiver, to which this set belongs, is now rightly regarded as the best type for general-purpose reception of both local and foreign stations. It provides the necessary degree of selectivity required under modern conditions, and from the point of view of quality of reproduction is not inferior to the straight three-valve receiver which it is now rapidly replacing.

The cabinet is of very modern design and the rectangular motif is carried out even to some of the control knobs. This is an excellent arrangement as far as the wave-range switch is concerned, but the volume control which is also fitted with a square knob may require to be set in a position which does not altogether harmonise with the lines of the design. The cabinet is of the horizontal type in which the loud speaker is on the same level as the controls, and it may be supplied as a table model or complete with a separate pedestal for two guineas extra.

The tuning dial is viewed through a rectangular aperture and is engaved with bold wavelength graduations as well as the names of the principal stations. A novel effect is produced by illuminating the scale with a green-tinted pilot lamp.

Accurate Calibration

On test we found the calibration of the scale to be far more accurate than is customary in sets of comparable price, and in no case did the setting of the stations vary by more than the depth of the lettering on the dial.

The set gave a very convincing performance on the score of selectivity and sensitivity, and, having regard to the fact that only four stages are employed, we can unhesitatingly award full marks in both these categories. In Central London adjacent channel separation can be relied upon on all stations with the exception of the two locals, but even here only one, or at the most two channels were lost on either side. On long waves Zeesen was received at unusually good strength and clear of Daventry and Radio-Paris. Over a few degrees at the lower end of the long-wave band, a certain amount of instability was noticed which was not influenced by the volume control. There was a commendable absence of second channel interference, and the only point at which this occurred was in the vicinity of Milan and Poste Parisien on the medium waveband.

While there is not too much output in the bass, the quality in the middle and upper registers is clear-cut and suggests the good reproduction of transients. The cabinet walls are only ¼in. thick, but there is no evidence of any tendency towards box resonance.

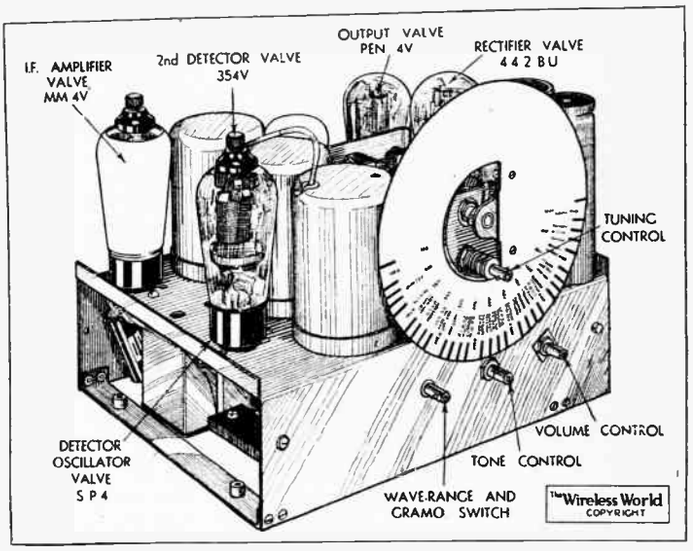
The circuit is straightforward in design, and, while nothing has been omitted which has proved to be detrimental to the results, economy has been observed in the matter of decoupling and by-pass condensers across bias resistances. After all, the criterion of performance as regards decoupling is stability, and, if we except a small band of frequencies at the unimportant lower end of the long-wave range, the behaviour of the set on this score may be regarded as satisfactory. As far as the bias arrangements are concerned the omission of the by-pass condenser does not affect quality, but only reduces volume for which compensation has been provided by the necessary extra amplification. The reduction in the number of resistances probably accounts for the fact that background hiss is below the average.

Modern Valves

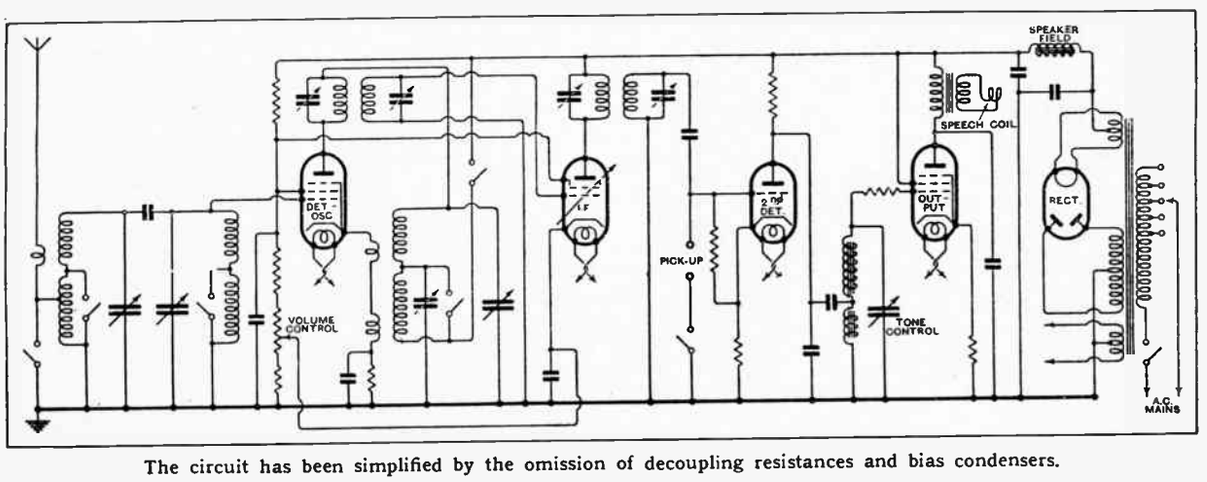
The first valve in the circuit is of the H.F. pentode type and performs the dual function of oscillator and first detector. It is preceded by a band-pass input filter, and is followed by an I.F. stage in which there are four tuned circuits. Volume is controlled by varying simultaneously the screen potential of both these stages, and the grid bias of the variable-mu I.F. valve. A section of the wave-range switch is used to interrupt the H.T. supply of the detector-oscillator when reproducing gramophone records. The second detector is a triode, and is coupled to the power pentode output valve through a minature parallel-fed transformer of the high permeability type.

Tone control is effected by a variable condenser shunted across the whole of the transformer winding.

The power supply circuit is straightforward, and smoothing, which is carried out by including the loud speaker field in the H.T. lead in conjunction with two electrolytic condensers, reduces the hum to a negligible level.



Chassis of the Climax S4 receiver viewed from the front.



The circuit has been simplified by the omission of decoupling resistances and bias condensers.

Next Week's Set Review:
BUSH RADIO BUSHRANGER

Letters to the Editor:—

Alternatives to the Disc Record

Range of B.B.C. Stations : Electricity Charges

The Editor does not hold himself responsible for the opinions of his correspondents

I SHOULD like to endorse everything Mr. King said in his letter to you on the subject of alternatives to the disc record.

When is the gramophone to be brought up to date?

It is high time that gramophone companies really considered this matter, the thing can be done and it only wants a lead to be given. While we have a lot to thank the recording companies for, I don't think they are to be congratulated on missing (or shelving, perhaps) a device to give us uninterrupted entertainment.

The record changers on the market are, after all, simply a compromise.

Writtle, Essex. W. GEORGE.

I WROTE to one of the leading gramophone and record manufacturers about three years ago, suggesting that a gramophone on the sound-on-film principle would be a good scheme, asking if they were experimenting with anything of the kind, and how soon such a machine was likely to appear on the market.

After a very short correspondence, in which they neither denied nor admitted anything, I was more or less told to be quiet and mind my own business.

W. V. TUGWELL.

Wotton-under-Edge, Glos.

I HAVE thought of writing a letter similar to that of Flight-Lieut. Patrick King for many months past. I very heartily endorse all that he says. The reproduction of records—the best records on the best reproducers—leaves a lot to be desired from a musical point of view, owing to the cut-off of the higher frequencies. I have yet to hear a piano record which sounds like a piano. Broadcast piano music on a good set can be, and is, practically indistinguishable from the real thing, but every piano record I've heard yet sounds as though the piano used needed tuning and all the ornaments taken from off the top. My prejudice against gramophones and disc records grows daily by comparison with good broadcast reproduction, and I shall never trouble about them until we have such a type as Flight-Lieut. King suggests.

I don't wish it to be inferred that gramophones are a wash-out, but simply that, from a musical standpoint, they are not as good as they might be, owing to high-frequency cut-off. This point, I believe, has already been argued at length in your Correspondence columns. I trust the big gramophone companies will favour us with a reply. INTERESTED.

Newcastle-upon-Tyne.

WE hope the following remarks concerning the photo-electric gramophone will be of interest to your correspondent, Flight-Lieut. Patrick King.

The reasons which have led this company not to market such a machine as he describes up to the present are:—

(1) Film is, we believe, the only satisfactory base for photographic recording. The high cost of this material would mean that the public would have to pay at least twice the present cost of recording on discs for the privilege of having it on film.

(2) Apart from the cost of film records, which make them uncommercial, it is also extremely difficult to produce them. Shellac records can be stamped out in thousands without difficulty, but films can be produced by direct printing from the negative only.

(3) At the present stage of radio and gramophone progress a reproducer for film records, if they were marketed, would cost at least twenty-five guineas, whereas disc records may be reproduced on acoustic instruments which are bought for far less than this sum.

(4) If Flight-Lieut. King is unable to enjoy records when played on the automatic changer, due to the intervals of eight seconds whilst the discs are being changed, we suggest that he should have a two-turn-table unit made specially for him, when complete works recorded on more than one disc can be played through without a break.

(5) Even up till the present day "His Master's Voice," from the outset of their career, have recorded the masterpieces of classical music, several of which have shown nothing but a substantial loss, but it is part of the Company's policy to do all it can in furthering the cause of appreciation of good music. Your correspondent has only to examine the record catalogues of "His Master's Voice" from 1903 onwards to confirm these facts.

RICHARD ARBIB,
Manager, Press Department,
The Gramophone Co., Ltd.

Hayes.

Range of B.B.C. Stations

IN your editorial of October 13th you state that transmitters on exclusive wavelengths of the order of 261 metres have an "after-sunset range," which you "conservatively place at 200 miles."

My experience of the London National transmitter (which is eighty-five miles distant) before the West National transmitter was superimposed upon it, does not support your statement. At only rare intervals was good reception possible after sunset. On most occasions it was badly marred by the most terrific distortion.

North Regional (120 miles distant), though more reliable than many stations owing to its higher wave, suffers badly from this type of distortion, which makes the reproduction of the Hallé Orchestra vary in pitch from a team of piccolos to a consort of bass drums. The combination of London National and West National is—outside its small local areas—useless owing to the rapid rhythmic beat interference, which results in this wave channel being a mere noise over two-thirds of the South of England.

The policy of the B.B.C. in radiating its expensive Dance Orchestra from these stations, while the Midland Regional enjoys two separate "Children's Hours," is somewhat mystifying. H. H.

North Gloucestershire.

Correspondence, which should be as brief as possible, should be addressed to the Editor, "The Wireless World," Dorset House, Stamford Street, S.E.1, and must be accompanied by the writer's name and address

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Electricity Charges

THE complicated tariff of charges given in "Colonel's" letter in your issue of October 13th calls for comment.

One would need an extra room to accommodate the meters which he imagines to be necessary!

I am being served by a two-part tariff: A fixed charge of 12s. per quarter and ½d. per unit for *all* energy consumed, the rent of the single meter being 1s. per quarter. This means electricity being really cheap and usable. Consumers are able to "blossom out" with fancy lighting effects, electric soldering-irons, lawn-mowers, and other devices without worry. Why are not such tariffs more general? A really cheap supply everywhere—though it may be costly to the suppliers at first—would soon stimulate consumption, and would also benefit the manufacturers and retailers of electrical appliances. H. H.

North Gloucestershire.

THE RADIO INDUSTRY

AT the recent International Exhibition of Inventions, Voigt Patents, Ltd., were awarded a gold medal certificate for a loud speaker fitted with their new type of diaphragm, which covers an exceptionally wide range of audio-frequencies.

Sinclair Speakers, of 49-50, Twyford Street. London, N.1, tell us that their telephone number is now *Terminus* 4355-4356, and that they are opening a Scottish branch at Baltic Chambers, Waterloo Street, Glasgow.

A large Tannoy radio-gramophone, with a number of extension loud speakers, has recently been installed on board H.M.S. Leander.

At last those who take an intelligent interest in their receivers are realising that a measuring instrument is an almost indispensable adjunct. In support of this opinion the makers of the Pifco Rotameter, an eight-range measuring instrument, inform us that the public demand has greatly exceeded their most sanguine expectations.

The Ever Ready Company has just opened its eighth dry-battery factory in the London area. The new establishment at Walthamstow is primarily intended for the manufacture and assembly of comparatively small cells, as used in radio batteries and electric torches, and is equipped with the most modern machinery for dealing with each stage of production, from the raw material to the finished article.

Change of Address

C. Webb, Ltd., special London agents for Eddystone short wave products, from 146, Charing Cross Road, to 14, Soho Street, London, W.1. Tel.: *Gerrard* 2089.

New Apparatus Reviewed

Latest Products of the Manufacturers

MAZDA AC/S2/PEN VALVE

THE Mazda AC/S2/Pen is a steep slope H.F. pentode-type valve for A.C. mains operation and has been designed primarily for use as the frequency changer in superheterodyne receivers. It is fitted with a seven-pin base with the connections arranged as now standardised for indirectly heated H.F. pentodes of this type.

The valve may be used either as a combined oscillator detector or in conjunction with a separate oscillator, but, whichever arrangement is adopted, cathode injection is advised since reradiation will then be appreciably less than with injection into either of the outer grids. Self-oscillating frequency changers of the high-gain variety are very prone to "squegger," but this can be avoided by keeping the time constant of the bias resistance and its condenser small; suitable values for the AC/S2/Pen would be 1,000 ohms and 0.1 mfd. respectively. Used in this manner an anode potential of between 200 and 250 volts is desirable, the screen grid may be given 100 volts and a negative bias of two volts applied to the control grid. The suppressor grid should be joined to the cathode and the metallising to the earth line.

Mazda AC/S2/Pen valve, designed especially for self-oscillating frequency-changer circuits.

Measurements made with a specimen valve using 250 volts on the anode, a screen potential of 100 and −2 volts grid bias, gave the mutual conductance as 4.05 mA/volt, the A.C. resistance for this set of conditions being 1.14 megohms. The anode current was 6.6 mA, and the screen current 2.1 mA. These results are substantially in agreement with the maker's rating, for the mutual conductance is given as 4 mA/volt under working conditions. With 4 volts A.C. the heater current is 0.97 amp.

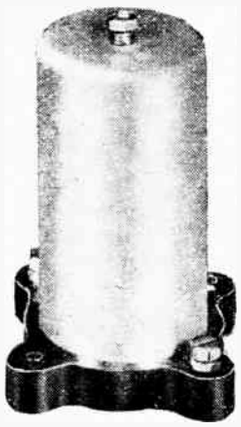
The AC/S2/Pen costs 17s. 6d., and it is obtainable from the Edison Swan Electric Co., Ltd., 155, Charing Cross Road, London, W.C.2.

NEW AMPLION H.F. CHOKE

THE latest addition to the Amplion range of components is a screened H.F. choke of high inductance which is suitable for general purpose use. It is wound on an ebonite former and sectionalised to ensure a low self-capacity, the maker's value being 4.5 m-mfds. On test the choke was found to be entirely satisfactory, the only resonance of any consequence falling at the very top of the medium waveband.

Its D.C. resistance is 650 ohms, and the inductance, measured at 1,000 cycles, 0.175 henry. The last-mentioned quantity will only be of interest if the choke is employed in a tone-corrected circuit where a knowledge of its low-frequency inductance would be necessary.

It is mounted on a moulded bakelite base, and an earthing point is provided.



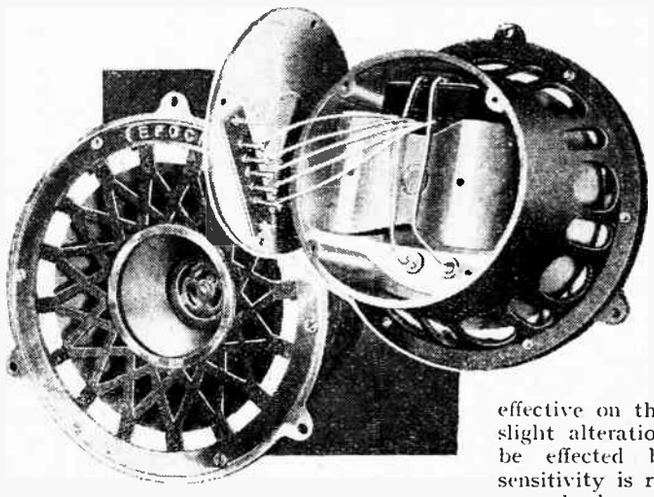
Amplion screened H.F. choke.

The makers are Amplion (1932), Ltd., 82-84, Rosoman Street, Rosebery Avenue, London, E.C.1, and the price is 3s. 6d.

EPOCH A2½ LOUD SPEAKER

FROM the external appearance it is evident that this unit is something a little out of the ordinary, and a closer inspection reveals many points which will commend it to the discriminating buyer. The diaphragm, for instance, is very freely suspended, and a soft leather surround takes the place of the usual moulded corrugations in the cone. The centring spider is also more flexible than usual, and, as might be expected, the bass response is excellent and is maintained fairly uniformly over a band from 65 to 95 cycles. There is a slight depression in the region of 200-300 cycles, but between 300 and 2,500 the output is aurally uniform. At the latter frequency there is a rise of about 6 db., which is maintained to 8,500 cycles, after which the response falls rapidly. There is no definite high-note resonance, and the performance at this end of the scale could hardly be bettered.

The efficiency is good and was equal to our energised standard loud speaker in the bass and above 2,500 cycles; but for the dip in the lower middle register the general level of efficiency would have been the same.



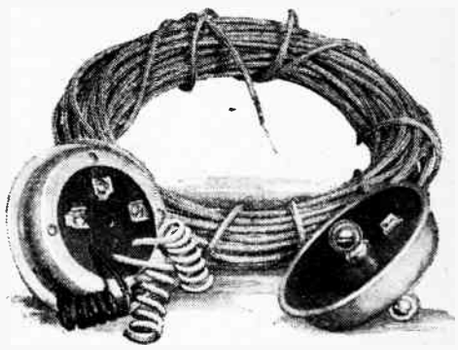
The Epoch A2½ permanent magnet loud speaker unit is effectively protected by a cast aluminium housing and diaphragm grille.

Mechanically the A2½ is exceptionally strong, and a high degree of reliability is to be expected. The price is 3 guineas, and a ten-ratio output transformer is included. A Class "B" transformer may be fitted if required. The makers are Epoch Radio Manufacturing Co., Ltd., Exmouth House, Exmouth Street, London, E.C.1.

BRYCE-LYNCH AERIAL SYSTEM

THE Bryce-Lynch Broadcast Aerial System has been introduced by W. Andrew Bryce and Co., Woodfield Works, Tile Street, Bury, Lancs, for combating interference generated by electric motors or domestic appliances and which render distant reception, and often that of the local station, impossible without a troublesome background of crackles and other objectionable noises.

It consists of a screened down-lead of comparatively small diameter with impedance matching transformers at each end. Its installation is simple and straightforward and entails very little alteration to the existing aerial. The downlead is detached and one transformer is fixed to the remaining horizontal portion. The screened cable is then connected between this transformer and another which is mounted adjacent to the receiver.



Bryce-Lynch screened aerial system comprising shielded cable and impedance-matching transformers.

Our tests show that the losses arising from its use on the medium waveband are very small indeed and will generally be taken care of by the reserve of sensitivity in the set. As with all screened down-lead systems interference is reduced in far greater proportion to the received signals, so that the full sensitivity of the receiver can be utilised where otherwise this would not be possible.

As the transformers are designed for the medium waves they are not quite so effective on the long waveband, but by a slight alteration in the wiring, which can be effected by an on-off switch, full sensitivity is regained, but with somewhat more background.

The price of the complete kit, including 50 feet of screened cable, is £2 5s.

READERS' PROBLEMS

THESE columns are reserved for the publication of matter of general interest arising out of problems submitted by our readers.
Readers requiring an individual reply to their technical questions by post are referred to "The Wireless World" Information Bureau, of which brief particulars, with the fee charged, are to be found at the foot of this page.

Comparing Coils

TO settle an argument we are asked to describe a simple method of comparing the relative goodness of two different types of tuning coil. The querist who asks our help in this matter states that he possesses no laboratory apparatus, but is fairly well provided with voltmeters, milliammeters, and the usual collection of "bits and pieces" that every amateur accumulates.

On the assumption that the coils to be compared are of roughly the same inductance value, it is quite easy to test their relative efficiencies, but, of course, quantitative measurements of H.F. resistance or dynamic resistance are more difficult. Fortunately, they are unnecessary in this case.

For a quick and easy comparative test, the absorption method of testing cannot be beaten. The underlying principle is that a tuned circuit will abstract energy from another tuned circuit in which oscillatory currents are flowing when the two are coupled together. All other things being equal, the absorbing circuit with the most efficient coil will abstract the greatest amount of energy.

This principle is put into practice by setting up the circuit shown diagramatically in Fig. 1. The test oscillator may consist of the plate and grid circuits of an ordinary reacting detector valve with a milliammeter in the anode circuit as an indicator. A coupling coil of a few turns is placed in inductive relationship with the oscillator coil, and is connected in series with the absorbing circuit of which the coil under test forms a part. For accurate comparisons it is essential that all coupling should take place through this coil, and that its position when once fixed should remain unchanged during the test. The best setting for a clear deflection is easily found after making a few trials.

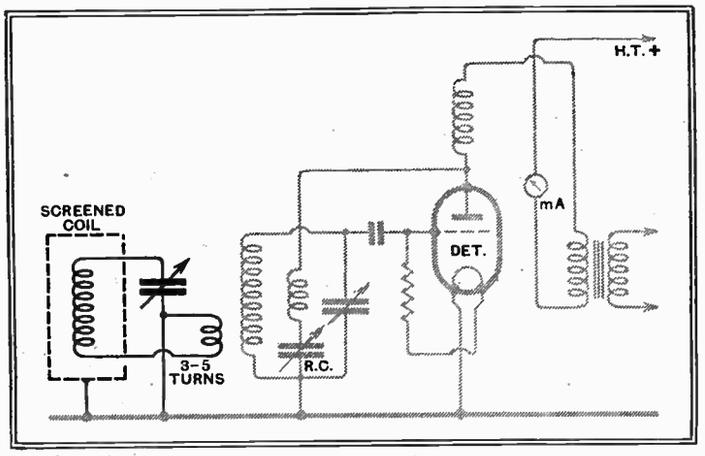


Fig. 1.—An improvised test for ascertaining the relative "goodness" of tuning coils at various wavelengths. The circuits of almost any regenerative receiver may be used.

Having set the detector valve into a state of self-oscillation by increasing reaction coupling, the condenser of the absorbing circuit is adjusted until the milliammeter indicates resonance by a sudden deflection. The extent of this deflection should be carefully noted; it will be a measure of the efficiency of the coil. Maximum deflection indicates maximum efficiency.

Ideal Down-lead Screen !

A CORRESPONDENT has discovered what would appear to be almost a perfect screen for his aerial down-lead. He proposes to pass it through a sheet-metal ventilation shaft which happens to run from the roof to a position in close proximity to the receiver.

We imagine that a few practical difficulties are in the way of putting his plan into operation; for instance, it would be highly desirable that the aerial down-lead should be centred in the shaft in order that its capacity to the metal should be as low as possible. If there are bends, it would appear none too easy to satisfy this requirement. But we think that the plan might be given a trial.

Testing I.F. Windings

ALTHOUGH I.F. transformers do not often give trouble, it is as well to make a practice of testing them when the performance of a receiver is below par. For example, a correspondent whose superheterodyne has lately shown a marked falling off in sensitivity, tells us that the secondary winding of his second I.F. transformer "seems to be completely disconnected internally." As signals—of a sort—are still receivable, he is inclined to think that his method of testing is at fault.

In all probability the winding *has* actually failed. It is by no means uncommon to find that there is sufficient stray coupling between the circuits to allow the set to go on working even when the secondary is completely disconnected. A break in the primary winding, however, will usually render the set dumb.

When testing the windings for continuity, it is also as well to make a rough test of ohmic resistance, if apparatus for doing so be available. Usually the resistance of typical I.F. couplings amounts to 50 ohms or more, and so a comparative test can be made without sensitive instruments. In most modern transformers, primaries and secondaries have the same resistance.

A.V.C. and Detuning

A READER is somewhat perturbed to find that the signal strength obtainable from his receiver (fitted with A.V.C.) is increased slightly but definitely by very slight detuning. In other words, maximum loudness of signals is obtained by rotating the tuning condenser a small part of a degree on either side of the position corresponding to true resonance (as shown by the tuning indicator).

This effect is by no means unusual. The effect of slight detuning is to decrease the H.F. voltage due to the carrier wave that is applied to the detector grid; due to the action of A.V.C., this will increase the overall sensitivity of the set, and so greater volume may be obtained while the circuits are tuned to the side-bands rather than to the carrier wave. But this increase of volume is only obtained at the expense of quality.

The Wireless World

INFORMATION BUREAU

THE service is intended primarily for readers meeting with difficulties in the construction, adjustment, operation, or maintenance of wireless receivers described in *The Wireless World*, or those of commercial design which from time to time are reviewed in the pages of *The Wireless World*. Every endeavour will be made to deal with queries on all wireless matters, provided that they are of such a nature that they can be dealt with satisfactorily in a letter.

Communications should be addressed to *The Wireless World* Information Bureau, Dorset House, Stamford Street, London, S.E.1, and must be accompanied by a remittance of 5s. to cover the cost of the service. The enquirer's name and address should be written in block letters at the top of all communications.

CLUB NEWS

Welcome to the New Premises

All radio enthusiasts in the neighbourhood are invited to the meetings of the Catford Radio and Television Society in their newly acquired premises at 257, Bromley Road, S.E.6. The greater part of the Society's time this session is being devoted to practical work. The Prince de Mahé has been elected President.

Hon. Secretary: Mr. H. Floyd, 38, Como Road, Forest Hill, S.E.23.

Measuring Light

"The Spectrum of Radiant Energy" and "The Measurement of Light" are among the subjects of interesting lectures and demonstrations to be given before the Radio, Physical and Television Society. New members are cordially welcomed and enquiries should be addressed to the Secretary, Mr. F. J. Bubear, 67, Nassau Road, Barnes, London, S.W.13.

For South London Transmitters

New members will be welcomed by the South London and District Radio Transmitters' Society, formed in March, 1931, and now ensconsced in comfortable quarters at the Brotherhood Hall, Knights Hill, West Norwood. Meetings: First Thursday of each month at 8 p.m.

Hon. Secretary: Mr. E. C. Taylor (2AUQ), 29, Sundridge Road, Addiscombe, Croydon.

Welcoming the Beginner

A special elementary class in "Wireless Theory and Practice" has been inaugurated for the benefit of new members of the Smethwick Wireless Society, which has arranged an attractive programme for the winter session.

Hon. Secretary: Mr. E. Fisher, M.A., 33, Freeth Street, Oldbury, Nr. Birmingham.

Short Waves and Television

All short wave enthusiasts and television amateurs are cordially invited to the meetings of the Thames Valley Amateur Short Wave Radio and Television Society, which is now organising transmitting and receiving tests as well as morse practice for beginners.

Hon. Secretary: Mr. Richard K. Shingold, Glenmore, Manygate Lane, Shepperton, Mddx.

HOW MANY LISTENERS REALISE?

17 Ratios for power or pentode: 4 for Class B give perfect matching. The Mansfield magnet gives greater sensitivity.

Extract from "Wireless World."

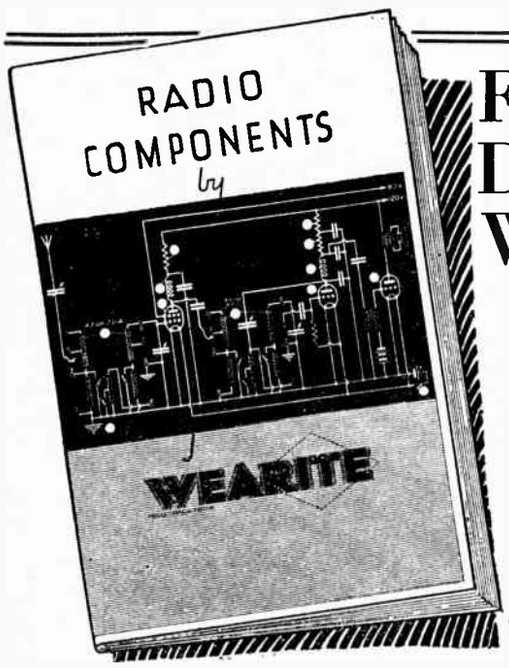
". . . . and a choice of seventeen ratios is available for single output valves and four ratios for push-pull stages requiring a centre tap. The change both in volume and quality, on varying the step-down ratio is most marked, and the load can be rapidly adjusted to give the best results. Tested with the load adjusted to the calculated value, the efficiency was found to be exceptionally good for a permanent-magnet unit. Above 100 cycles it was equal to that of our standard 10 in. energised unit. The PM4A is also remarkable for the excellent response at the extreme top. Between 7,000 and 9,000 cycles it has a better output than any small commercial unit so far tested."

A user writes:

"I wonder how many listeners realise (as I did when trying out the 'Microlode' pointer) how much volume is wasted when the speaker is not correctly matched to the output valve."

'Microlode' Model PM4A **42/-** 'Microlode' Model PM6 **32/6**

Whiteley Electrical Radio Co. Ltd., Dept. W, Radio Works, Mansfield, Notts.



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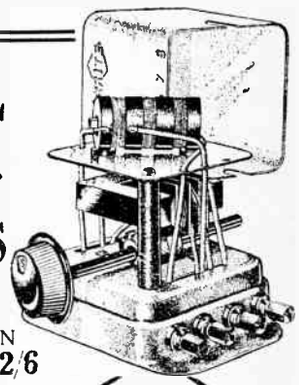

are given in this NEW The SENIOR NUCLEON COIL **12/6**

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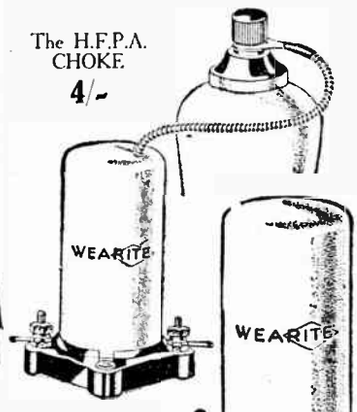
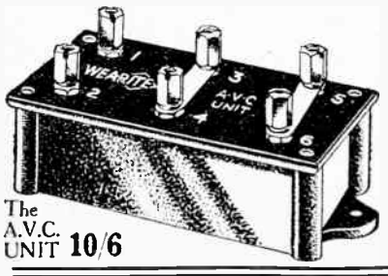
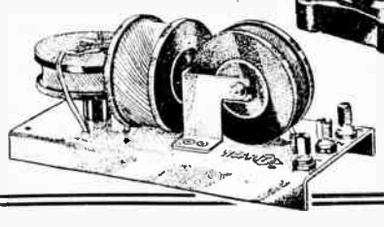


The H.F.P.A. CHOKE **4/-**



The A.V.C. UNIT **10/6**

The Low Pass Filter **15/6**



The H.F.P. CHOKE **3/6**

ILLUSTRATED BOOK

Whatever set you're working on, or contemplating, this book will provide a wealth of assistance—every latest component development is included—with full data. A.V.C., Class "B," Super-het. gear, Coils of every type. Everything is covered. Send for your copy NOW—and also for constructor's details of the WEARITE TEAMSTER 4-VALVE RECEIVER.

COUPON To MESSRS. WRIGHT & WEAIRE, LTD., 740, High Road, Tottenham, N.17.

Please send me a copy of your **NEW BOOKLET (S32)**, together with Full-size Blue Print and constructional details for building the **WEARITE-TEAMSTER** Receiver. Also include special literature on Class "B."

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MISCELLANEOUS ADVERTISEMENTS

NOTICES.

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12 words or less, 3/- and 3d. for every additional word.

Each paragraph is charged separately and name and address must be counted.

SERIES DISCOUNTS are allowed to Trade Advertisers as follows on orders for consecutive insertions, provided a contract is placed in advance, and in the absence of fresh instructions the entire "copy" is repeated from the previous issue: 13 consecutive insertions 5%; 28 consecutive, 10%; 52 consecutive, 15%.

ADVERTISEMENTS for these columns are accepted up to FIRST POST on MONDAY MORNING (previous to date of issue) at the Head Offices of "The Wireless World," Dorset House, Stamford Street, London, S.E.1, or on SATURDAY MORNING at the Branch Offices, 19, Hertford Street, Coventry; Guildhall Buildings, Navigation Street, Birmingham, 2; 260, Deansgate, Manchester, 3; 26B, Renfield Street, Glasgow, C.2.

Advertisements that arrive too late for a particular issue will automatically be inserted in the following issue unless accompanied by instructions to the contrary. All advertisements in this section must be strictly prepaid.

The proprietors retain the right to refuse or withdraw advertisements at their discretion.

Postal Orders and Cheques sent in payment for advertisements should be made & Co. payable to ILIFFE & SONS Ltd., and crossed Notes being untraceable if lost in transit should not be sent as remittances.

All letters relating to advertisements should quote the number which is printed at the end of each advertisement and the date of the issue in which it appeared.

The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

NUMBERED ADDRESSES.

For the convenience of private advertisers, letters may be addressed to numbers at "The Wireless World" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box 000, c/o "The Wireless World." All replies should be addressed to the Box number shown in the advertisement, c/o "The Wireless World," Dorset House, Stamford Street, London, S.E.1. *Readers who reply to Box No. advertisements are warned against sending remittance through the post except in registered envelopes; in all such cases the use of the Deposit System is recommended, and the envelope should be clearly marked "Deposit Department."*

DEPOSIT SYSTEM.

Readers who hesitate to send money to advertisers in these columns may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Wireless World," both parties are advised of its receipt.

The time allowed for decision is three days, counting from receipt of goods, after which period, if buyer decides not to retain goods, they must be returned to sender. If a sale is effected, buyer instructs us to remit amount to seller, but if not, seller instructs us to return amount to depositor. Carriage is paid by the buyer, but in the event of no sale, and subject to there being no different arrangement between buyer and seller, each pays carriage one way. The seller takes the risk of loss or damage in transit, for which we take no responsibility. For all transactions up to £10, a deposit fee of 1/– is charged; on transactions over £10 and under £50, the fee is 2/6; over £50, 5/-. All deposit matters are dealt with at Dorset House, Stamford Street, London, S.E.1, and cheques and money orders should be made payable to Iliffe & Sons Limited.

SPECIAL NOTE.—Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post. When sending remittances direct to an advertiser, stamp for return should also be included for use in the event of the application proving unsuccessful.

RECEIVERS AND AMPLIFIERS, ETC.

PYE Twin Triple Battery and Eliminator A.C., perfect; £7/10.—Flaxman 4849, 4-7 p.m. [3933

SECOND-HAND Receivers for Sale; lists.—Parkhouse, Bigeuor Farm, Petworth, Sussex. [3925

MILDMAY RADIO EXCHANGE Offers the Following, sound and perfect and as stated:—

1933 Brownie 3-valve A.C. Mains Receivers, with valves and in sealed boxes, specification: screen grid, detector, pentode output, in beautiful figured walnut cabinet, suitable for A.C. mains 200-250 volts; £6/10 each, original list price £15/15; special terms to trade.

PHONE Demonstration: Clissold 5001.

OPEN Thursday, closed Saturday all day.

ALL Carriage Paid.

24, Mildmay Grove, London, N.1. [3800

TELSEN "464," £7/15; Ferranti "Lancastria," £12/15.—Box 8592, c/o *The Wireless World*. [3932

CROSSLEY 8v. A.C. Superhet, condition perfect; nearest £10.—Johnson, 13, Old Broad St., City. [3928

B.T.H. Amplifiers.—Small type A.C./H.L., A.C./P., and 2-A.C./P.1's in push-pul' volume control, etc.; £3 each, complete with valves.

12-WATT Type, with 2-P.P.5/400's push-pull in output stage; £15; brand new.

B.T.H. Pick-up Tone Arms, 3/-; carriage paid, cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3 Advance 3668. [3773

PHILIPS Super Inductive 5 A.C., 1933; £23; perfect; no reasonable offer refused; demonstration.—5, West Side, Wimbledon. Tel.: 3470 [3950

A.V.C. Three, new and exact to "W.W." specification, with valves, £8; unwanted present.—Particulars, 151, Wellingborough Rd., Northampton. [3949

W.W. Short Wave 2, 12-80 metres, with valves, B.T.H. D.C. Minor and pentode O.P. transformer; offers.—Millar, 74, Commercial St., Dundee. 3940

"NEW CENTURY" Super Complet: Kit, author's choice Mullard valves, guaranteed as new; cost £12, best offer, or separate.—McBride, Havelock St., Spalding. [3929

OSTAR Ganz Combined A.C./D.C. All-electric Set, 3 valves and Magnavox moving coil, in walnut cabinet; listed £11/11, our price £4/19/6; c.o.d., carriage paid.—Kay, 167, City Rd., London, E.C.1. [3815

ARMSTRONG 1934 Universal A.C.-D.C. 4v. Chassis, incorporating 3 tuned circuits, 9 kilocycle separation, giving practically superheterodyne performance, full vision scale, one knob tuning, combined one knob switching, 1½ watts output, 75/-; with valves, 114/-.

ARMSTRONG Latest 4v. A.C. Chassis, 3 tuned circuits, 9 kilocycles separation, square peak, single knob tuning, high frequency pentode, power grid detection, multi-grid 2½ watts output, ideal for making radiogram, 79/-; with valves, 118/-; both models fully guaranteed, 7 days' trial, demonstration any time.—'Phone: Gulliver 3105. Armstrong Co., 100, King's Rd., N.W.1. [3883

EVERY Make of Set, kit or component supplied; very liberal part exchange value for any surplus goods; in fairness to yourself, get our quotation; second-hand values are still good in Scotland, hence our high offers.—Macindoe and Co., 99, Waterloo St., Glasgow. [3927

PILOT AUTHOR KITS

Exact to Specification

A.V.C. THREE

Kit 'A'—Author's Kit of First Specified Parts, including Peto-Scott Plymax Chassis and Ply Panel, assembled and drilled, less valves and cabinet.

Cash or C.O.D. Carriage Paid. **£10-15** *or 12 monthly payments of 19/9.*

Kit 'B'—As Kit 'A' with Specified Valves, but less Cabinet. Cash or C.O.D. Carriage Paid. **£14-1-6**

or £2-1-6 Deposit and £1 monthly payments of 24/-.

Kit 'C'—As Kit 'A' but with Valves and recommended PETO-SCOTT Table Cabinet. Cash or C.O.D. Carriage Paid **£15-6-6**

or Deposit £3-6-6; Balance in 11 monthly payments of 24/-.

KIT-BITS *Selected C.O.D. Items. You pay the postman. We pay post charges all orders value over 10/-.*

	£	s.	d.
1 J.B. "Nugang" No. 2064 3-gang Variable Condenser and Disc Drive	1	2	6
3 WEARITE "Nucleon" Coils, B.P.1, B.P.2, T.G.	1	17	6
1 MULTITONE "Toco" Transformer 1:4		17	6
1 DAVENSET No. 101 Power Smoothing Choke		16	0
1 VORTEXION Type AC34 Mains Transformer		18	0
1 PETO-SCOTT Plymax Baseboard, 12×15×2½in.		11	6
Set of Specified Valves	3	6	6
Specified PETO-SCOTT Cabinet	1	5	0

ALWAYS BUILD ON PLYMAX
PETO-SCOTT PLYMAX CHASSIS AND PLY PANEL SOLELY SPECIFIED. Plymax Chassis as specified by the Author, drilled and assembled, 15"×12"×8½". Cash or C.O.D. Post and Packing 1/3 extra. **14/-**

FINISHED INSTRUMENT
We SPECIALISE in Finished Instruments of all "Wireless World" Sets. Built exact to specification in Customers' own special cabinet designs if required. Send full details for quotation by return.

D.C. SUPER-HET

KIT 'A.'—Author's Kit of First Specified Parts, including Peto-Scott Plymax Chassis and Ply Panel, assembled and drilled, less valves and cabinet.

Cash or C.O.D. Carriage Paid. **£12**

or £2 Deposit and 11 monthly payments of 20/-

KIT 'B.'—As Kit 'A,' but with specified valves. Cash or c.o.d. Carriage Paid. **£15.9.6**
or Deposit £2.9.6 and 11 monthly payments of 26/-.

KIT 'C.'—As Kit 'A,' but complete with specified valves and cabinet. Cash or c.o.d. Carriage Paid **£16.12.0**
or Deposit £3.12.0 and 11 monthly payments of 26/-.

PETO-SCOTT PLYMAX CHASSIS AND PLY PANEL SOLELY SPECIFIED. Plymax Chassis as specified by the Author, drilled and assembled, 16"×10"×2½". Cash or C.O.D. Post and Packing 1/3 extra. **12/6**

NEW MONODIAL

KIT 'A.'—Author's Kit of First Specified Parts for RECEIVER PORTION ONLY, including Peto-Scottassembled and drilled Plymax Chassis, Panel, less cabinet and valves.

Cash or C.O.D. Carriage Paid. **£11-12** *or Deposit £1.12.0 and 11 monthly payments of 20/-*

POWER UNIT KIT Author's Kit of FIRST SPECIFIED PARTS for POWER UNIT ONLY but with Plymax Chassis and Valves. Cash or C.O.D. Carriage Paid. **£9.0.0** *or 12 monthly payments of 16/6.*

COMPLETE KIT comprising complete SET and POWER UNIT PORTIONS with specified valves. Cash or C.O.D. Carriage Paid. **£27.18.6** *or £5.18.6 Deposit and 11 monthly payments of £2.4.0.*

PLYMAX Baseboard assembled and drilled as specified by the Author for RECEIVER PORTION, 14"×12"×3". **10/6**
PLYMAX Baseboard assembled and drilled as specified by the Author for POWER UNIT PORTION, 18"×6½"×3". **7/6**

IMMEDIATE DELIVERY
CASH — C.O.D. — H.P.

FOREIGN ORDERS. Send one-third value of goods with order. Balance (including forwarding charges) payable to our forwarding agents on delivery. Insurance effected if desired. All orders carefully executed and expertly packed by special export staff.

PETO-SCOTT CO. LTD.
77, CITY ROAD, LONDON, E.C.1.
West End Showrooms: **62, High Holborn, London, W.C.1**

Receivers and Amplifiers, Etc.—Contd.

PURLEY RADIO, Ltd., offer the following 1933 demonstration sets, absolutely as new: Radio-Grams, Pye G/R.G., 19 guineas; Marconi 330, 18 guineas; Climax A.C.3, 14 guineas. Receivers: Ultra Tiger Consolette, 11 guineas; Philips 830A, Philips 830B, Philco Baby Grand, Pye M.M., K.B.320, Anglo Super 4, all 10 guineas; Adagams, 49 guineas; K.B. battery Pup, Marconi 248 and Trix, Class B unit, complete, all 3 guinea; also the following second-hand sets, in perfect order: Magnificent Majestic 65-guinea Radiogram, 28 guineas; Everyman 4, complete with combined eliminator and trickle charger, 5 guineas; Marconi model 39, Osram Music Magnet, 4 guineas each, and numerous other bargains in portables, eliminators and speakers, etc.—Purley Radio, Ltd., 18, Tudor Court Purley, Surrey. 'Phone: 1994. [3970

MAINS EQUIPMENT

N.P. Battery Chargers for A.C. Mains; trade lists free.

N.P. Make Chargers to Suit Requirements; send for prices; we are the lowest in the trade.

N.P. Advise on all Matters of Battery Charging with Diagrams and Instructions.

N.P. Have a Few Slightly Soiled Travellers' Models, bargains for cash; trial 7 days; satisfaction or cash refunded.

N.P. Special Charger this Week, 720 volts 140 m.a., dynamo-motor, for A.C. mains, suitable H.T. batteries, trial; cost £25, bargain, £7, or offer.

N.P. Station Charger, 75 volts, 6 amps., 3 circuits; £12/7/6; used demonstration only; bargain; others.

N.P. Buy Your Old Plant in Part Exchange New Instrument; send details and price wanted.

N.P. Send Trade Lists and Photographs of all Sizes Battery Chargers from £3 to £17.—Nash Products, Ltd. (Dept. W.W.), Stechford, Birmingham, 9. [3943

A.C. CHARGERS Supply the Latest Models in Battery Charging Plants.

A.C. Will Send Trade Literature, with prices of models with 4 circuits H.T. and L.T., 0-½, 0-1, 0-1½, 0-3 amp., 30 volts on each, will charge 120 volts H.T. and 50-100 L.T. batteries at once for 1/-; price £10/12/6.—A.C. Chargers, 22, Hall St., Willenhall, Staffs. [3770

HOYNE'S Transformers and Chokes the Best Obtainable, perfect insulation, regulation and reliability.

HOYNE'S Transformers, used by many well known set manufacturers after testing all others.

HOYNE'S Transformers, fitted with tapped and screened primaries, filaments all centre tapped, stout cast aluminium clamps and clearly marked terminal strips are fitted to all models.

HOYNE'S Components are Guaranteed for One Year; built to your own specification at very competitive prices.

HOYNE'S Components.—The components you will eventually use, start right; a dud cannot pass the Hoyne test.

HOYNE'S A.V.C. Three, 275-0-275v. 60-70 m.a., 4v. 2.5a. 4v. 4a., 12/6, post 1/; choke, 30 henry 50 m.a., 7/6, post 6d.

HOYNE'S New Monodial Transformer 425-0-425v. 120 m.a., 4v. 3a., 4v. 1a., 4v. 1a., 4v. 6a., 24/-, post 1/3; weight 10lb.; 10 henry choke, 6/-, post 6d.; 20 henry choke, 7/6, post 6d.

HOYNE'S.—250-0-250v. 60 m.a., 4v. 1-2a., 4v. 2-4a., 10/-, post 9d.; with extra 4v. 1-2a. winding, 12/6, post 1/-.

HOYNE'S Ferrocart Model.—350-0-350v. 60-70 m.a., 4v. 2-3a., 4v. 2-4a., 12/6, post 1/-; with extra 4v. 1-2a winding, 13/6, post 1/-.

(This advertisement continued on next page.)

A Word in Your Ear on Moving Coil Speakers

FACT No. 2.

Radio Manufacturers Must have Reliability

Nearly All Choose ROLA

Over 4 Millions in Use

"Returns" are too expensive an item for Radio manufacturers to use anything but components of assured reliability. They must have the best . . . and they choose Rola. So much is this the case that by far the greater part of Rola's huge output goes straight to Radio manufacturers. Be guided by their knowledge and experience—install a speaker on which you can rely.

The model illustrated above is the ROLA FR5-PM (6in. dia.). Price 29/6 complete with Universal transformer for pentode or power valves, or Class B transformer. In the latter case state Class B valve used when ordering.

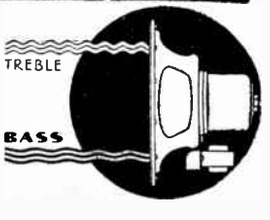
EXTENSION SPEAKERS

There is a correct Rola Extension Speaker for practically all British Radio Receivers. Rola speakers are used by nearly all British Radio Manufacturers. As it is highly desirable to have the speech coil impedance of the Extension Speaker similar to that of the speaker in the receiver the necessity for using Rola Extension Speakers is manifest.

THE BRITISH ROLA CO. LTD.,
Minerva Road, PARK ROYAL, N.W.10.
'Phone: Willesden 4322-3-4-5.

ROLA
the World's Finest Reproducers

ROLA SPEAKERS *for better Radio Reception*



Mains Equipment.—Contd.

(This advertisement continued from previous page.)

HOYNE'S.—350-0-350v. 120 m.a., 4v. 2-3a., 4v. 4-6a., 4v. 1a., 4v. 1a., 16/-, post 1/3.

HOYNE'S.—500-450-0-450-500v. 140 m.a., 4v. 2-4a., 4v. 4-6a., 4v. 2a., 4v. 2a., 27/6, post 1/3; weight 11lb.

HOYNE'S.—0-110-135v. 90 m.a., suitable for H.T. 6 or 7, 7/6, post 9d.; with 4v. 2-4a. winding, 9/6, post 9d.

HOYNE'S.—200v. 200 m.a., 4v. 2-4a., 4v. 1-2a., for H.T. 8; 13/6, post 1/-.

HOYNE'S Chokes, very generous cores, cotton interleaved, fitted with cast aluminium clamps and terminal strips: 30H., 60 m.a., 900 ohms, 6/6, post 9d.; 30H., 120 m.a., 400 ohms, 8/6, post 1/-.

HOYNE'S Line Transformers (auto wound), tapped 0-100-110-200-220-240v., 60 watt, 8/6, post 9d.; 120 watt, 10/-, post 1/-.

M. J. HOYNE, Offices and Works, 8a, Gladstone Rd., Wimbledon, S.W.19. Tel.: Liberty 3303 [3930

VORTEXION Lead Again.

VORTEXION A.C./34, used by author in construction of A.V.C. Three, as illustrated, 18/-.

VORTEXION, Wimbledon, for 99.9% reliable transformers.

IF You Haven't Tried Them Yet Ask Someone Who Has, or call and inspect complimentary letters.

GUARANTEED 12 Months, and within 5% normal and 2½% super models, neat shrouding, with detachable feet, as used by Government Departments, etc., etc.

VORTEXION.—New Monodial transformer, 200-250, 50 cycles, 425-0-425, 120 m.a., 4v. C.T. 3a., 4v. C.T. 1a., 4v. C.T. 1a., 4v. C.T. 6a., screen primary, open type, 20/-; shrouded, 22/-; super shrouded, 26/-; weight 14lb., carriage 2/- extra; 10 henry choke, 5/6, post 9d.; 20 henry, 8/6.

VORTEXION.—5-watt Monodial A.V.C. model. 400-0-400, 120 m.a., 4v. 6a., 4v. 3½a., 4v. 2a., 4v. 1a., super screened, 20/-; shrouded, 24/-.

ALL Secondaries Centre Tapped.

VORTEXION.—250-0-250 60 m.a., 4v. 1 to 2a., 4v. 2 to 4a., open type, 10/6; shrouded, 12/6; post 9d.

VORTEXION D.C.4 Choke, specified for D.C. superhet; 8/6.

VORTEXION Transformers, tested with 2,000 volts between windings.

VORTEXION.—Ferrocart III, 350-0-350, 60 m.a., 4v. 2.5, C.T., 4v. 3.5, C.T.; open type 13/6, shrouded 16/-; post 9d.

VORTEXION.—Super model for H.T.8 or 9 or 10, 4v. 1 to 2, 4v. 2 to 4; open type 14/6, shrouded 16/6; post 1/-.

VORTEXION.—350-0-350, 120 m.a., 4v. 2 to 5a., 4v. 2 to 4a., 4v. 2.5a.; open type 14/6, shrouded 16/6.

VORTEXION.—400 or 450 or 500v., 120 m.a., 4v. 2 to 5, 4v. 2 to 5, 4v. 2 to 5; open type 19/-, shrouded 23/-.

VORTEXION.—400 or 450 or 500, 150 m.a., 4v. 4a., 4v. 2.5, 4v. 2, 4v. 2, 4v. 2, core size 2¼×1¼in., a superb job, 2% regulation, 35/-; shrouded with terminals, less terminals, 30/-, open type 26/-; post 1/3.

VORTEXION Auto Transformers to B.E.S.A. Specification, 100, 110, or 120v. to 200, 220 or 240 volts, 60 watts, 9/-, post 9d.; 120 watts, shrouded 12/6, open type 10/6, post 1/-; 200 watts, open 14/6, shrouded 16/6, post 1/-; 2,000 watts, £4/10.

VORTEXION 600-watt Transformers; £4/10, carriage free.

VORTEXION 30h, at 60 m.a. Chokes, 5/6; 40h. at 60 m.a., 8/6; 30h. at 150 m.a., 200 ohms, 10/6 open type, 12/6 shrouded.

VORTEXION Transformers Made to Your Specification; price according to wattage, 6v. filaments same price unless wattage grossly exceeded; special quotations by return. See our display advert. on page 22.

VORTEXION (S. A. BROWN), 182, The Broadway, Wimbledon, S.W.19. Tel.: Liberty 2814. [3820

TANTALUM for A.C. Chargers, H.T. and L.T.—Blackwell's Metallurgical Works, Ltd., Garston, Liverpool. [3448

A.C. Battery Charger, 30-volt output, £3/12/6; another 100 output.—Write Jersey, Cumnor Hill, Oxford. [3883

SERADEX PRODUCTS, as used by the leading manufacturers and set designers; full range of lists for stamp.

SERADEX Resistances, specified for "New Monodial" and "D.C. Superhet"; delivery of above kits ex stock.

MONODIAL A Kit, comprising 19 resistors, 12/-; kit B, including tapped power resistor, 6/10.

SERADEX Resistors for "D.C. Superhet" kit of 11, as used by the designers; 9/-.

SERADEX Filter Condensers, type B, 400 volts working, 1 mfd. 1/6, 2 mfd. 2/3, 4 mfd. 4/5; 4×4 mfd. 7/3, 8×8 mfd. 14/6.

SERADEX Tubular Condensers, 400v. working, 0.005 mfd. to 0.1 mfd., 8d. each; 0.25 mfd. 9d.; all Seradex condensers are non-inductive.

SERADEX Battery Chargers, illustrated catalogue of 20 models, for stamp.

SERADEX Products are Manufactured and Distributed by Trevor Pepper, 575, Moseley Rd., Birmingham, 12. Telephone: Calthorpe 1618. [3965

"DULCI" Unused D.C. Eliminators, 25 milliamps output, 13/ each; post paid, cash with order or c.o.d. Ward, 12, Tredegar Rd., Bow, E.3 [3850

CABINETS.

RADIO-GRAM Cabinets; fully illustrated list free; remarkable values.—Gilbert, Cabinet Maker, Swindon. [1686

MANUFACTURER'S Clearance Lines of Cabinets for Radiograms, loud-speakers, and radio sets; hundreds to select from; send us particulars of your requirements, giving size of set, etc.—H. L. Smith and Co., Ltd., 289, Edgware Rd., London, W.2. [3832

EPTON Leads Again!—Just arrived; Philomel modernistic cabinets, enamelled art shade (15¼×15½×9½), to hold 3-4 valve set and speaker, 8/9; also last few polished walnut cabinets, with speaker frets, Alba (18×14¼×10¼), 14/6; Philco type, undrilled (15 12½×7½), 10/6; callers after 8 p.m.—Epton, 93, New Rd., Chingford, E.4. [3963

DYNAMOS, ETC.

ROTARY Converters, 220 volts D.C. to 200 Volts A.C., capacities up to 0.44 K.V.A., from £4/10. Milo Engineering Works, Milo Rd., East Dulwich, S.E.22. 'Phone: Sydenham 4422. [3891

T. W. THOMPSON & CO.

SURPLUS CLEARANCE DEPOT

17, Strutton Ground, S.W.1

Telephone: Franklin 6355.

Nearest Station, St. James's Park (Underground).

ALL GOODS ON THREE DAYS' APPROVAL AGAINST CASH OR C.O.D. (I.F.S. EXCEPTED).

ALL GOODS OFFERED SUBJECT TO BEING UNSOLD.

Open Week-days 9 o'clock until 7.30 p.m.

Having purchased the whole Equipment of a large Cinema Firm in Liquidation, we offer the following:—

COMPLETE CINEMA TALKIE EQUIPMENT.—Consisting of 2 50-watt Philips amplifiers complete with valves, 2 sound heads, 2 photo cells, casium, 4 1-stage amplifiers, 2 Monitor speakers, 1 super Philips Super Cinema M.C. speaker, A.C. 2 speedometers, resistances, 2 A.C. motors, Fadens, etc., £45 lot. **WESTON PHOTO ELECTRIC CELLS.**—New, list £7 10s., guaranteed, to clear, 17/6, post 6d. **LARGE CINEMA AMPLIFIERS, PHILIPS.**—50-watt, complete with valves, in good order, £20 each. **EPOCH SUPER CINEMA SPEAKERS, A.C.**—Listed at £17 10s., to clear, £8 10s. **WRIGHT DE COSTES CINEMA SPEAKERS.**—5 gns., a magnificent bargain. **SLEKTUN L.F. TRANSFORMERS.**—Listed 8/6, to clear, 3/9, post 4d. **DUAL WAVE COILS.**—Iron core, latest type, listed 6/6; our price, 3/6, post 1d. **MULTI RATIO TRANSFORMERS.**—1 ratios, suitable for push-pull, etc., 4/9, post 6d. **100 U. BLUE SPOT SPEAKERS.**—Balanced armature, complete with cone and chassis, list 39/6, to clear, 15/6, post 1/-. **ELECTROLYTIC CONDENSERS.**—Brand new, 150-volt working, 8 m.f., 3/9, post 1d.; 4 m.f., 3/6, post 3d. **FAY ACOUSTIC MODEL HOME RECORDERS.**—Comprising tracking device, needle sharpener, fibre needles and recording diamond stylus, acoustic soundbox and horn, brand new in box; great amusement for anybody making their own records; listed 30/-, to clear, 5/- each, post 6d. **DIAMOND CUTTING STYLUS.**—2/6 each. **ALUMINIUM DISCS READY FOR RECORDING.**—To suit above recorders, 6in. dia., 4/- dozen. **FAY RECORD ALBUMS.**—To carry 10in. records, very neat and beautifully covered, 6d. each. **WEGO CONDENSERS.**—With tappings 3.6 m.f. 500 v., new, 1/6, post 3d., 8.25 m.f. T.C.C. tapped 500 v., 2/9, post 3d.; 10.5 m.f. T.C.C. tapped, 3/-, post 4d.; 8.5 m.f. H.M.V. tapped, 2/6, post 4d.; 3.6 m.f. Wego, 500 volt tapped, 1/9, post 3d.; 4 m.f. Siemens, 500 volt, 2/-, post 3d. **D.C. ELIMINATORS.**—200/250 volt input, output 150 volt; 30 m.a., 2 pos. tappings, 1 variable, all new and guaranteed, 10/6, post 9d.; 3 positive tappings and variable, 15/-, post 9d. **PHILIPS 1-WATT RESISTANCES.**—Full range from 100 ohms up to 100,000 ohms, 6d. each, post free. **HOUSE TELEPHONES.**—Complete table and desk type, 10/6 each, post 9d. **JUNIT ELECTRIC CLOCKS.**—For A.C. Mains, Boudoir type, 19/6. **HIGHEST GRADE REISZ PATTERN MICROPHONES.**—In heavy polished octagonal aluminium case, with rings for suspension, even response for amplifiers up to 60 watts. Transformers for all models, 5/6 extra. Nickel and oxydised stand for Reisz mics., 12/6 extra. Price of microphone, 55/-, post 1/-. **MAINS DROPPING RESISTANCES.**—592 ohms 40 watts, reducing from 200/250 volts to 15 volts ½ amp., 2/- each, post free. **LEAD 1/.044 V.I.R. CABLE.**—5/- per 110-yard coil, post 9d. Lead twin cable, 1/.044, 4/- per dozen yards, post 9d. **BROWN'S METAL ELIMINATOR CASES.**—Size 10½in.×6in.×5in., 9d. each, post 6d. **ELECTRIC LIGHT AND POWER CHECK METERS.**—For A.C. Mains, 200/250 volts 50 periods. No more wondering as to the amount of current this or that article is using. Here is the check on same. Useful for checking consumption of sub-let flats, charging plants, motors, wireless apparatus, or anything using electricity. A few shillings will save pounds. Makers: Westinghouse and other well-known makers. Cost £1 18s. each. We are clearing these in good working order, jewelled pivots, 6/- each, post 1/3. **HIGH GRADE TRANSMITTING MICROPHONES.**—Brand new and complete with breast fixing attachment; cost 30/-, to clear, 6/- each, post 9d. **FILMOPHONE UNBREAKABLE GRAMOPHONE RECORDS.**—All the latest dance records and selections, were listed at 1/6, to clear, 5/- per dozen, post 9d. **ELECTRIC IRONS.**—200/250 volts, 5 lb., 7/9, post 6d. **MAINS WIRING CABLE.**—Consisting of tinned wire, heavily coated Sistoflex, 10ft., 2d.; 1½d. special price for quantities. **A.C. ELIMINATORS.**—3 tappings, 200/250 volt input, output 150 volts 30 m.a., 32/6, post 1/-.

SECRETS OF THE FILING CABINET!

Extracts from Postbags being so popular just now, how about this one? . . . . . "The reproduction obtained is of an amazingly high standard; the frequency response is very much wider than that of any speaker which the writer has tested. Both the extreme low base and high treble are so strongly given that all other speakers are One-Noters by comparison. The reproduction of transients is really amazing, making all other speakers sound blurred . . . . The reproduction of all kinds of speech and music is well-nigh perfect . . . . All the wind instruments stand out separately and clearly, the resolving power of the speaker in the extreme upper register being so good. The wispiness and delicacy of the string is first-rate and no other speaker gives an approach to concert hall string tone . . . . The base is round and deep. There is no trace of boom which is common in most speakers. One hears the real growl of the double basses, not just a one-note hoot. All percussion instruments are excellently reproduced and the attack is splendid and powerful."

(The original is available for inspection.)

D.C. Model - £7 7 0

A.C. Model - £8 8 0

32 pages of technical information sent for a 1½d. stamp.

HARTLEY TURNER RADIO LTD.,
THORNBURY ROAD, ISLEWORTH, MIDDLESEX.
Telephone: Hounslow 1854.

Electradix Bargains in

METERS AND INDICATING INSTRUMENTS, ETC.

We carry large stocks of Meters from 3/6 upwards. Switchboard Ammeters of 3in. to 8in. dial of from 0 to 10 amps. to 0 to 1,000 amps. both A.C. and D.C.

GALVANOMETERS. Vertical type Ballistic with mirror on coil, quite new, by Tinsley, **60/-**. Ditto, in brass case **90/-**. Universal Multiplying Galvo Shunts, **35/-**. Silvertown, Siemens and Fuller horizontal 3¼in. Galvos. **7/6**. Vertical Telegraph type, **4/6**.

TESTING SETS. By Elliott, Nalder Bros., and Crompton. Army type E.10, in double case with Moving Coil Meter 0 to 3, reading to .1 with glass top radio test rheostat, **18/6**. Multi-range type portable E. 108, scaled 0 to 30 milli-amps., 0 to 3 amps., 0 to 30 amps., and 0 to 30 volts **37/6**. **£50** Crompton Master Laboratory All Range Test Set for any current between 15 milli-amps and 600 amps., and 150 milli-volts to 600 volts. Magnificent Set in case, with shunts and volt range switch, **£7**. Nalder, Edgcumbe or Johnson & Phillips, **£9**. High Voltage Breakdown Test Sets to 120,000 volts, **£12**.

RESISTANCE MEASURING SETS.

Suspension Nalder Universal with multiplying shunts and standard. Usual price, £15. Sale, **£6 10s**. Famous Silvertown Testing Sets, Bridge type with Galvo. Tested and guaranteed, only **£7 15s**. each. Capacity Bridges .00001 mf. to 10 mf., **£10**.

Hilger Spectroscope, £45 list, less prism, **£7 10s**.

OHMMETERS AND MEGGERS.

500 volt "Meggers" to 10 megohms, **£15 10s**. 100 volt Meggers, low reading model, 1,000 ohms to 10 megohms, **£12**. 1,000 v. 200 megs. **£15**. 500 volt, 2-set Eversheds recalibrated and tested O.K. to 50 megs., **£9 10s**. Two 200 v., 2-set Meggers "Evershed" recalibrated and tested O.K. to 10 megs., **£8 10s**. EVERSHED Bridge Megger, only **£15**, with Res. Box **£20**. Capacity Megger, .005 to 1 mfd., **£20**.

WHEATSTONE BRIDGES.

10,000 ohm. Wheatstone Bridge with C.Z. Galvo. Paul Model Dial Bridge with Galvo. Range to 100,000 ohms., **£10**. G.P.O. Type, H.R. Bridge, **£7 10s**. Sub-divided ohm Box, reads by 1/20th ohm. in 1/20 steps to 20 ohms., **45/-**. Bridge Res. Bobbins, **4/6** each.

SWITCHGEAR.

We build chargers, Switchboards and Automatic Circuit Breakers and can assemble any Switchboard you require. Sindanyo, slate, marble or steel panels. Tell us your needs.

Dimmers, Controllers and special Multi-charging Switches. Send us your enquiries and we will meet your requirements.

ENGINEERING.

Morse Silent Chains new, 29in. long, with large and small sprockets and Chain Cases, 1-H.P. rating, for motor drive, **35/-**, quarter price, 19 Skew drive Gear Boxes for Cinema, ¼ to ½ H.P., **10/-**. Rubber Diaphragms, 18in. dia, 1/16in. thick, new, **2/6**. Thermoflashers, **2/8**. 220 Thermoflashers 2/6.

Aluminium Horne Record, Perf. Disc., 6in. dia. **5/-** doz. 10in. dia., **7/-** doz. Real Diamond Record Cutters, fit any pick-up, **10/-** each.

MIRRORS. Helio or Television, 5½ dia., centre scale, **1/6**. Parabolic Concave, 24in. dia., **30/-**, 20in. dia., **25/-**, 10in. dia., **20/-**.

ELECTRADIX RADIOS,
218, UPPER THAMES STREET, E.C.4. *'Phone: City 0191.*

GRAMOPHONES, PICK-UPS, ETC.

CAIRMOR Recording Apparatus, large mike, diamond stylus; £6, offers.—Petter, Caius, Cambridge. [3961

30/- !!!—B.T.H. R.K. moving coil speakers, 6in. cone, new and unused, guaranteed; these speakers are the type as used in cinema sound equipment, suitable for public address work; weight 30lb., and vastly superior to the cheap speakers now on the market, 100 volts, 150 volts, and 200 volts D.C.

27/6 !!!—6-volt D.C. speakers, as above; £2/7/6 speaker as above for 100-250 volts A.C., complete with field rectifier.

B.T.H. Transformer, brand new, ratios 1-1, 2-1, 20-1, and 30-1 microphone; 7/- each.

CARRIAGE Paid, cash with order, or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3771

H.D. Radio Electrical Service Offers Surplus of a Set Manufacturer, every article guaranteed new, moving coil speakers, Magnavox type D.C.144, 2,500 ohms or 7,500 ohms complete with transformer at 18/-; type D.C.142, same voltages, at 25/-; all fitted Humbuckers; all goods carriage paid; cash with order or c.o.d.—No. 9, Kingly St., London, W.1. Regent 6240. [3880

RADIO Agencies have for Disposal New Moving Coil Speakers, all guaranteed, sealed cartons, approval willingly, all worth three times the advertised price, real hefty jobs.—Magnavox X core (U.S.A.) Juniors, 7½in. cones, 2,500 or 6,500 ohms, at 18/-; Seniors, 8¾in. cones, same voltages, 25/-, state is power or pentode transformer; Rola (U.S.A.) K type Juniors, 2,500 or 6,500 ohms, 18/-; Seniors, 9in. cones, same voltages, 25/-, state which transformer; number of permanent magnets and dual speakers; all goods carriage paid, cash with order, or c.o.d.—Radio Agencies, 37, Albermarle St., London, W.1. [3936

LOUD-SPEAKERS.

ALL Steel Speaker Pots are 50% More Efficient; made in all sizes up to 6in. dia., 10in. long; also field windings for same up to 100 watts; prices and particulars by return.—H. Crompton, Woodfield Terrace, Bury. [3969

VALVES.

8/9.—Ostar Ganz valves, any type; buy a spare set while our stocks last, state type and voltage required; c.o.d., postage paid.—Kay, 167, City Rd., London, E.C.1. [3814

M.R.D.'s Own Guaranteed British Valves, as advertised last week, all carriage paid, and guaranteed six months.—Mains Radio Development Co., 4-6, Muswell Hill Rd., London, N.6. [3945

EPTON Leads Again!—American, Continental, Ostar Ganz and other types non-ring valves; see also "Cabinets" section; callers after 8 p.m.—Epton, 93, New Rd., Chingford, E.4. [3964

AMERICAN Valves.—Brand new R.C.A. and Arcturus; 224s, 247s, 235s; 151s, 10/6; 227s, 245s, 227s, 7/6; cash with order or c.o.d.—Norman Michel, 51, St. Matthew's Parade, Northampton. [3956

ALL Latest Types of Brand New American Valves, first class makes: 247s, 235s, 224s, 236s, 237s, 233s, 245s, 244s, 12/-; 227s, 226s, 280s, 245s, 9/6; 242s, 232s, 11/-; U.X.210s, 15/-; U.X.250s, 7 watts output, 16/-; 281s, 14/6; post paid, cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3772

NEWMAN, the Valve Man!—Just arrived, 2,000 brand new latest type American valves, all boxed, guaranteed R.C.A. manufacture; 235 11/-, 224 12/-, 236 13/-, 247 13/6, 237 13/-, 233 15/3, 245 8/-, 244, 14/-, 227 8/-, 226 6/-, 280 8/-, 242 14/-, 232 13/6, 6A7 16/-, etc., etc.; send us your enquiries, prompt attention for cash or c.o.d.—Newmans, 309, Roman Rd., Bow, E.3. [3892

SPECIAL Offer.—Valves by world-famous Continental manufacturers, fully guaranteed, screen grid, variable mu screen grid, high magnification screen grid, low magnification screen grid, H, HL, L, RC; all the above standard mains type, 4/6 each; Philips 328 valves, 5/6; 329 lamps, 2/-, the following 4 volt battery valves at 2/- each, H, HL, L, power.—Premier Supply Stores, 20-22, High St., Clapham, S.W.4. Macaulay 2188. [3911

COMPONENTS, ETC., FOR SALE.

PREMIER.

PREMIER SUPPLY STORES Offer the following Set Manufacturers' Surplus New Goods at a fraction of the Original Cost, all goods guaranteed perfect, carriage paid over 5/-, under 5/- postage 6d. extra (Ireland, carriage forward).

ELIMINATOR Kits, including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v. 20 m.a., 20/-; trickle charger 8/- extra; 150v. 30 milliamps, with 4v. 2-4 amps C.T., L.T., 25/-; trickle charger, 6/6 extra; 250v. 60 milliamps, with 4v. 3-5 amps. C.T., L.T., 30/-; 200v. 100 milliamps, with 4v. 3-5 amps. C.T., L.T., 49/6; 300v. 60 milliamps, with 4v. 3-5 amps. C.T., L.T., 37/6.

T.C.C. Condensers, 750v. working, 2 mf., 3/6; 4 mf. 6/-, 4 mf. 450v. working 4/-, 250v. working 1 mf. 1/3, 2 mf. 1/9, 4 mf. 2/6, 1,500v. working Standoff insulators 0.5 mf. 1/6, 2 mfd. 6/-, aqueous electrolytic 440v. working, 4 mf. 3/-, 8 mf. 5/6.

ALL the Following Lines 6d. each or 5/- per dozen; 4- and 5-pin chassis mounting valve holders; shielded screen grid or pentode leads 1-watt wire end resistances, any value; 0.1 condensers; on-off switches push-pull; polar ganging devices; 0.02 condensers, 0.5 condensers, 0.01 condensers, 0.2 condensers.

POLAR 3-gang 0.0005 Condensers, split end vanes, totally screened disc drive; 6/11.

AMSCO Triple-gang 0.0005 Condensers, with trimmers, 4/11.

T.C.C. Electrolytic Condensers, 100 volts working, 15 mfd.; 1/3.

PREMIER Chokes, 40 m.a., 25 hys., 4/-; 65 m.a., 30 hys., 6/-; 150 m.a., 30 hys., 10/6.

PYE Chokes, 20 or 32 hys., 4/-; Premier multi-ratio output transformers, giving 15 different ratios, 7/6.

HIGH Inductance Chokes, resistance 2,500 ohms, 80 henrys, 60 m.a.; 5/6.

WESTINGHOUSE Metal Rectifiers: 120v. at 20 m.a., 6/6; 180v. at 30 m.a., 8/6.

HARLEY Pick-up, complete with arm and volume control; 12/6

(This advertisement continued on next page.)

TANNOY

'SOUND' EQUIPMENT FOR ALL PURPOSES — FROM 2 TO 150 WATTS UNDISTORTED A.C. AMPLIFIERS, SPEAKERS, MICROPHONES, ETC.

FOR QUALITY AMPLIFICATION CONSULT:—

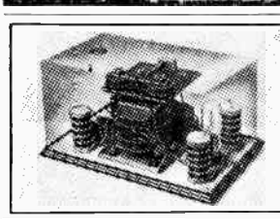
TANNOY PRODUCTS
(GUY R. FOUNTAIN LTD.)
CANTERBURY GROVE, WEST NORWOOD, LONDON, S.E.27.

'Phone: Streatham 6730 (3 lines)

Micromesh TRADE MARK
THE MODERN VALVE

Literature and prices on request.

Standard Telephones & Cables Ltd., St. Chad's Place, 264, Gray's Inn Rd., London, W.C.1



80 watt Converter at £5 - 19 - 6

Complete with Filter and Screen. 100/110 and 200/250 D.C. input, to 200/250 A.C. output at 50 cycles. Guaranteed 12 months. Sent 7 days appro. Cash or C.O.D.

"Desk" Electrical Products, 2, County Rd., Swindon

SAVAGE
FOR MAINS TRANSFORMERS
56/58, CLERKENWELL ROAD, LONDON, E.C.1.
'Phone: Clerkenwell 3068/9.

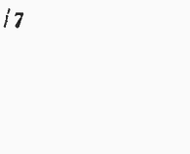
Foremost as Pioneers

Varley

Proprietors: OLIVER PELL CONTROL LTD.

TRANSFORMER AND CHOKE STAMPINGS, INSTRUMENT AND RESISTANCE WIRES.
Lists Free
LUMEN ELECTRIC CO.
9, SCARISBRICK AVE., LITHERLAND, LIVERPOOL, 21

Famous Maker's Offer



LIST FREE.

HALF PRICE! 50% Discount during next 10 days.

BUY **DIRECT**—save 10/- IN £1. No middle profits. Finest Radio Furniture as supplied B.B.C. GUARANTEED Piano-Tone acoustically.

DIRECT—on FREE TRIAL.
(Cash or 10/- monthly.)
BARGAIN LIST (10 days only)

Picketts Piano-Tone Cabinets, Albion Rd. (W.W.) Bexleyheath, Kent

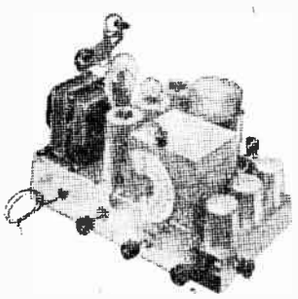
BON MARCHÉ

BRIXTON, LONDON, S.W.9

South London's Leading Radio Store

'Phone: Brixton 6201.

Clearance of Secondhand Surplus and Dismantled Receivers bought by us in Part Exchange. Unrepeatable Bargains all on 3 days' approval against cash!



7 only **SIX-VALVE CHASSIS** made by Kennedy Co. of America. 2 Variable Mu H.F. stages, Detector, L.F. Amplifier, and Power Pentode Output stages. Long and Short Waves, 1 Dial Tuning, complete with 7 Knobs and Escutcheon. 200/250 volts A.C., 40/100 periods. Takes American Base.

VALVES. Steel Chassis and totally Screened Coils. First class bargain. Sent carriage paid, Pick-up Terminals provided. **£3 19 6** carriage paid.

SET BARGAINS. 1 only English **CLARION** 5-Valve Table Model, Walnut case, including all Valves (English), 2 S.G. Det, Pentode and Rectifier, Single Dial Tuning. List Price £15 15/-, our price **£4 19 6** (carriage extra). 3 only **5-VALVE PORTABLE SETS,** minus Valves, suit ase type, **20/-** each. Expert could make £10 10/- Set out of them for small additional cost. Carriage extra. 1 only **MC MICHAEL PORTABLE** 5-Valve Receiver including 5 British BRVMA Valves, **no** Batteries, Suitcase type in Hide, absolutely as new, listed at £35, 2 years' ago. Beautiful Walnut panel and vernier Dials. First remittance secures, **£3 19 6.**

Final few **CAMCO RADIOGRAM CASES** as illustration on left, in Walnut, finely grained. Front and Legs. Size 43×23×16in. deep. To-day's value £6 10/-, clearance price, **£3 19/6.**

LOUDSPEAKER BARGAINS. 5 only Horn type Speakers, **5/-** plus carriage 1/6. **1 B.T.H. C2 type** Horn Speaker, were 45/-, our price **9/6,** plus 1/- carriage. **1 GECOPHONE** folded Horn type Speaker in neat Mahogany Case, usually £2 2/- value, for **9/6** (1/- carriage extra) 1 only 5-Valve **GAINSBOROUGH** Superhet Table Model, complete in Walnut Case, BRVMA Valves. M.C. Speaker, AC 200/250 volts only. To-days' value £11 11/-, our price delivered **£8 15/-.** 1 only **CORNERGRAM** Radiogram, 4 Valves A.C. Bandpass. A.C. Motor and Ediswan Pick-up. Moving Coil Speaker, Compact Case, Magnevox Speaker, BRVMA Valves. To-day's value £17/17/-, our price to clear **£10 10/-.** Carriage paid. 1 **EKCO** Eliminator IV20, **15/-.** 1 **REGENTONE,** L.T. Charger, 2 4-6 volts. 1 amp., 200 500 volts, **10/6.** 1 **GRAM MOTOR,** Apollo double Spring, 12in. Turntable, **12/6.** 1 **BLUE SPOT** Senior Pick-up with Universal Swivel Arm, 12/- value, our price **12 6.** 1 **BLUE SPOT** "Ideal" Unit with Major Cone Chassis, worth 37/6, to clear at **10/-.** Carriage extra. 1 **PYE** L.F. Choke, **3/6;** 1 pair **FORMO** 6-piu Coils, 2 range, **4/-** the pair. 1 Mahogany **APOLLO GRAM CASE,** Pedestal type, 36×18×18, first class condition. Suit Radiogram, to clear, **15/-,** plus packing and carriage. 1 **DULCETTO** Mahogany **PEDESTAL GRAM,** stands 34in. high, complete with Motor, Sound-box, etc., to clear at **£2 17 6** plus carriage. **SEVERAL 3-VALVE SETS** in Oak Table Cases, Det. 2 L.F. Valuable for parts, no Valves. Need only slight attention to get working. Satisfaction or money refunded, **19.6.** 1 **AMPLION** Lion Chassis, **12/6** (postage extra) 1 **ULTRA** Air Chrome, large size, **14/-.** 1 **BLUE SPOT,** 100 U-Unit and Chassis, **9/6.** 1 **ORMOND** Unit and Chassis in Cabinet to clear, **7/6.**

11 ONLY left, as advertised, **RADIOGRAM CASES** as illustrated, right. Size, 38×25×16in. Front drilled for escutcheon, otherwise perfect, **17/6** each, plus 2/6 carriage (C.O.D. charges).

BON MARCHÉ Ltd.

BRIXTON ROAD, S.W.9

Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)

BRITISH RADIOPHONE Wire Wound Potentiometers, with mains switch incorporated, 5,000 ohms, 10,000 ohms, 50,000 ohms, 100,000 ohms, any value; 3/6.

KOLSTER BRANDES Gramophone Motors, dual type, can be worked by clockwork or mains, induction type 100-250 volts, 27/6, complete with all fittings and turntable.

MAGNAVOX D.C.144, 2,500 ohms, 17/6; Magnavox D.C.142, 1,000 ohms, 21/-; all complete with Humbucking coils; please state whether power or pentode transformer required; A.C. conversion kit for either type, 10/-.

SPECIAL Offer.—Microphones by prominent manufacturer, high sensitivity, uniform response, complete with stand, transformer and battery; listed £3/15, our price 18/6.

PREMIER British Made Meters, moving iron, flush mounting, accurate; 0-15, 0-50, 0-100, 0-250 milliamps., 0-1, 0-5 amps., all at 6/-.

ORMOND Condensers, 2-gang, semi shielded, 2/6; wire wound potentiometers, 15,000 ohms, 1/6.

SPECIAL Offer of Mains Transformers, manufactured by Philips, input 100-115v. or 200-250v., output 180-0-180 volts, 40 m.a., 4v. 1a., and 4v. 3a., 4/6; 200-0-200v., 4v. 1a., 4v. 3a., 4/6.

ALL Premier Guaranteed Mains Transformers have engraved terminal strips with terminal connections, input 20-250 volts, 40-100 cycles, all windings paper interleaved.

PREMIER H.T.8 Transformers, 250v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 25/-.

PREMIER H.T.9 Transformer, 300v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectified, 26/-.

PREMIER H.T.10 Transformer, 200v. 100 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.

DOUBLE Spring Motors, made by Garrard, play five sides of 10in. record, complete with turntable and all fittings; 17/6.

MCMICHAEL 2-screen Grid Pentode Transportable 4, complete; gets many stations; £3; no valves or batteries.

SPECIAL Offer.—Accumulator chargers, input 200-250v. A.C. to charge 2- and 4-volt accumulators at ½ amp.; owing to the high efficiency of the silver oxide rectifier employed charger may be used during broadcast; 9/6 each.

CENTRALAB Potentiometers: 50,000, 250,000 and 500,000 ohms, 2/- each; ditto, wire wound, 200 ohms and 400 ohms, 1/-.

A FEW More Only.—Western Electric 4211E's and 4211D's, 15/-; 4212's, £3; callers only.

WESTERN ELECTRIC Mains Transformers: 500-0-500v. 150 m.a., 4v. 3-5 amps., 4v. 2.5 amps., 4v. 2-3 amps., 4v. 1 amp., C.T., 4v. 1 amp., C.T.; 19/6.

RELIABLE Canned Coils with circuit; accurately matched; dual range; 3/- per coil.

PREMIER L.T. Supply Units, consisting of Premier transformer and Westinghouse rectifier, inputs 200-250 A.C. output, 8v. ½ amp., 13/6; 8v. 1 amp., 17/6. 15v. 1 amp., 19/-; 6v. 2 amp., 27/6; 30v. 1a., 37/6.

PREMIER Mains Transformer, output 135v. 80 m.a., for voltage doubling, 8/6; 4v. 3-4a., c.t., L.T., 2/- extra; Westinghouse rectifier for above, giving 180v. 30 m.a., 8/6.

PREMIER Mains Transformers, output 250-0-250 volts 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary, 15/-.

PREMIER Mains Transformers, output 350-0-350 volts, 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary; 15/-.

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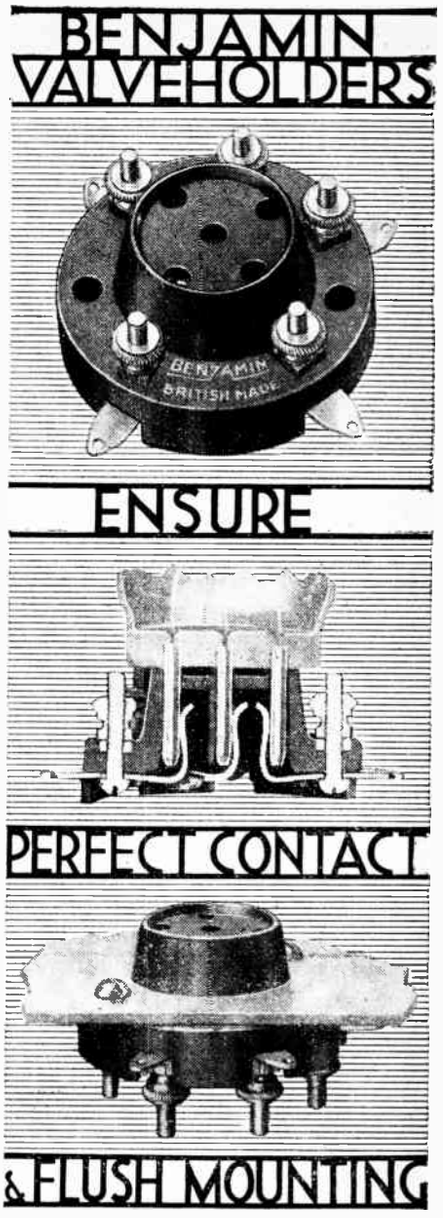
PREMIER. [3972

AF5, 12/-; OP1c, 10/-; B3, 4/-; R.I. 25H. (second-hand), 4/-.—3, Ruskin Ave., E.12. [3955

COSSOR Model 234, with valves, 40/-; Radiophone 4-gang, with cover, 10/-; Ferranti AF8 5/6, AT4 7/6, AF6, case damaged, 8/6, R.I. DY25 choke (second-hand), 6/-; Dapracon pick-up 6/-, guaranteed.—Bolton, 13, Ashville Rd., Leytonstone, E.11. [3954



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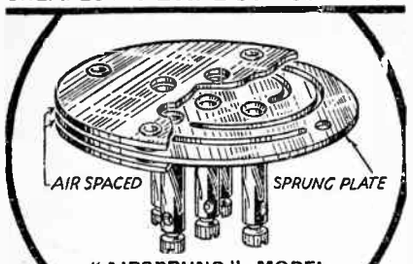

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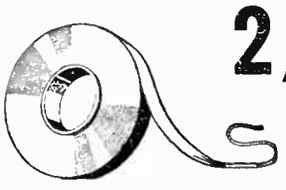

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R. [3934

WOBURN RADIO Offer Following Set Manufacturers' Clearance Lines:—

CLASS B driver and choke, 9/6 pair; Class B valve holder, chassis type, 9d.; Amplion mica tuning condensers 0005, 9d.; Graham Farish 0003 and 0002, 9d.; fixed condensers, all values, 2/6 dozen; 4-5 pin Clix valve holders, 3/- dozen; H.F. chokes 10d.; binocular chokes, 1/3; ST500 coils, 5/6 pair; Dur-Amasco 3-gang 0005 with trimmers and drum drive, 7/6; Ferranti output transformers 18, 23, 32-1, 4/11; Erie resistances ½-watt, 4/6 dozen; 1-watt 350, 20,000, 25,000 and 40,000, 6/6 doz.; 2-watt 20,000, 1/-; panel mounting milliammeters, 0-25, 0-50, 0-100, 4/11; Siemens 0.01×0.01mfd., 3,500v. test, 1/7; Siemens 4mfd. 500v. test, 2/3; Hydra and T.C.C. 2mfd. 500v. test, 1/3; Sinclair P.M. speakers, 19/6, all as last week.—Woburn Radio Co., 7, Woburn Buildings, W.C.1. Euston 1571. [3953

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AMERICAN S.G. Valves, 432 3/-; Climax Autobat D.C. eliminator, list 34s., 15/-; Ecko ditto, 120v. 12 mm., 12/-.—Mains Radio Development Company, 4-6, Muswell Hill Rd., London, N.6. [3946

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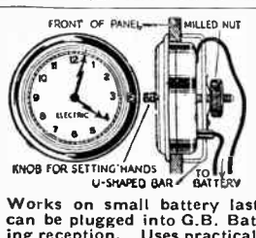

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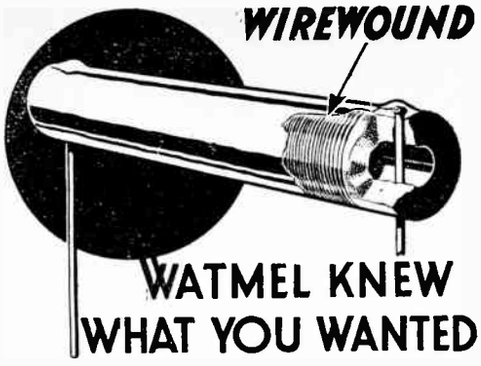

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ALL-MAINS Transformers and Chokes Guaranteed for 12 Months, specials quoted for and delivery given within 3 days of order.
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EX-MANUFACTURER'S Mains Transformers, suitable Ferrocart III, tapped input 200-250v., outputs 350-0-350v., 70-80 m.a., 4v. 2a., 4v. 3-4a., C.T., 9/6; post 9d.; a real snip.
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UTILITY 3-gang Condensers, new, with split end vanes and separate trimmers, S.M. disc drive; bargain, 10/6; post.
FINAL Clearance Offer of Blue Spot 100U, Inductor Speakers, new, boxed; list 35/-, 14/6; post 1/-; secure yours now.
CHASSIS Mounting Valve Holders, 4-5-pin, 3d. each, post 1½d.; 2/6 doz., post 3d.; Leowe 4-watt vacuum resistances, 50,000, 100,000 ohms, 9d. each, post 1½d.; bargain, manufacturer's parallel feed intervalve transformers, 2/6 each, post 3d.; T.C.C. 9 M.F. (4+4+1), as new, 250v. working, 3/6, post 6d.; Siemen's 4 M.F. 250v. working, 2/-; Hydra M.F., 250v., 1/6, post 4d.
ALL Goods Three Days' Approval Against Cash, or c.o.d.
EBURY BRIDGE RADIO Co., 33, Ebury Bridge Rd., S.W.1 (near Victoria Station, No. 11 'bus to Ebury Bridge). Sloane 8407. [3974

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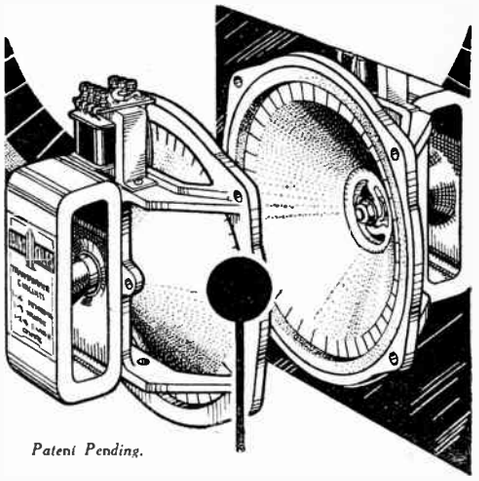
Synchromesh-

Just as synchromesh gears have proved the inferiority of the old type gear box, so the *Serrated Surround* marks a great advance in Loud Speaker design.



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An exclusive feature of the SOUND SPEAKER

The Sound Sales P.M. M.C. Speaker gives BASS WITHOUT BOOM

The Technical Press substantiate our claims

"Adequate response at 60 cycles without frequency doubling. No bad resonance at 100 cycles as commonly found. The speaker was found to hold its own with the best of its class in regard to tone . . . Sensitivity . . . above the average . . . The unit is well constructed, and marks a very commendable entry of this firm into the loud speaker field."
Vide "Wireless Trader," Oct. 28th, 1933.

"For those who are looking for something really good in the way of reproduction, we can confidently recommend this speaker."
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THE SOUND SPEAKER TYPE 50/8000 is a precision constructed high grade moving coil reproducer employing a cast aluminium cone mounting.

The universal speech input transformer is provided with tappings to suit either Triode, Pentode or class "B" valves.

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Each model of Epoch Speaker represents much greater value for money than other makes. Epoch uses permanent magnets of 9 per cent. to 35 per cent. Cobalt Steel, the most efficient, costly and most magnetically durable: most other makes employ relatively cheap chrome or tungsten steel, or low content cobalt steel.

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ROTARY Convertor, 6-12 volts d.c. input, 500v. 50 m.a. d.c. output, brush gear damaged or missing, windings sound, 10/- each; motor generator, ½h.p. a.c. motor, 220v., 50 cycles, 1ph., make Century repulsion induction, 720 volt, 150 m.a. d.c. dynamo, shunt regulator, etc., complete in sheet steel case, £7/10.—Below.

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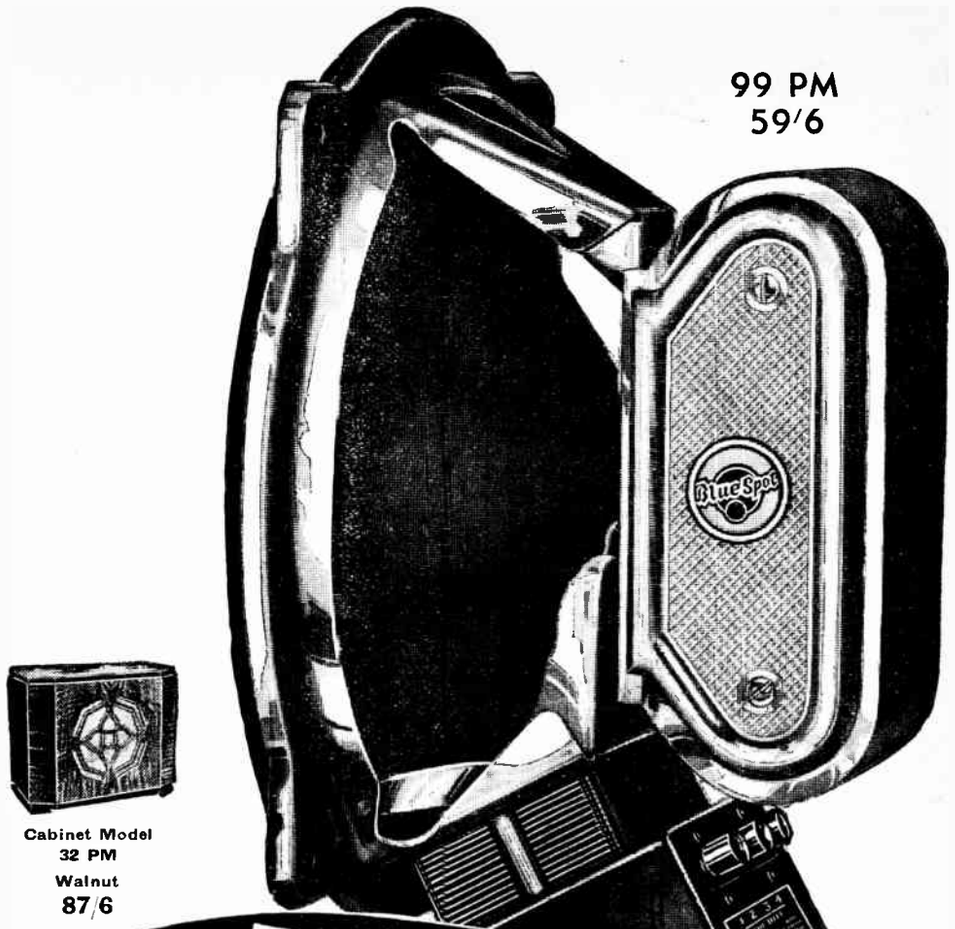

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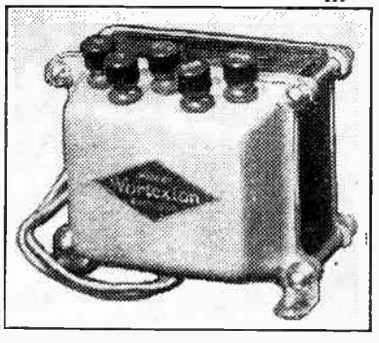

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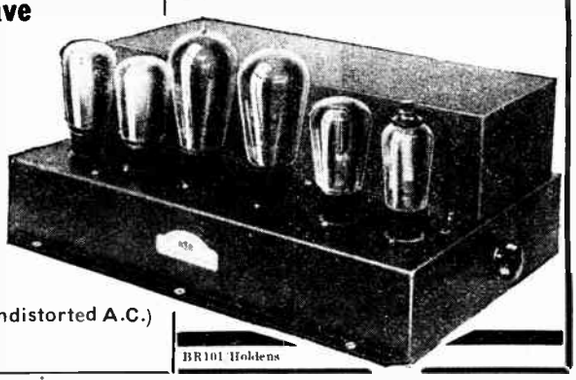
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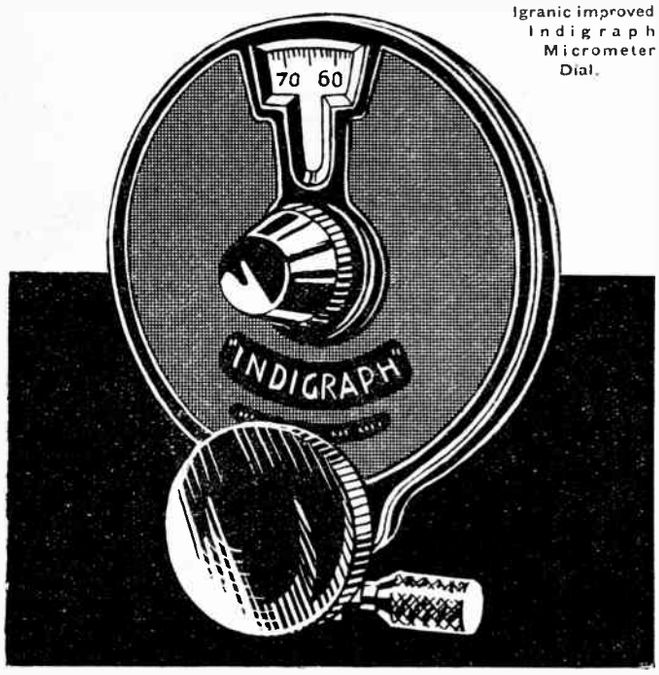

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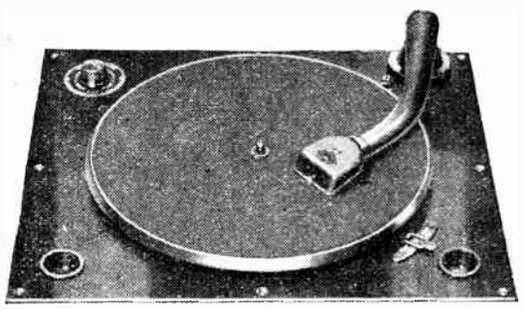

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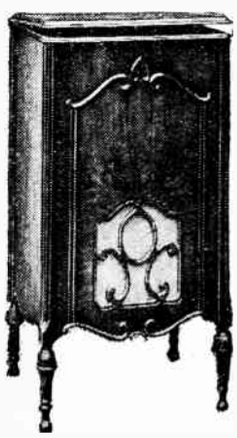

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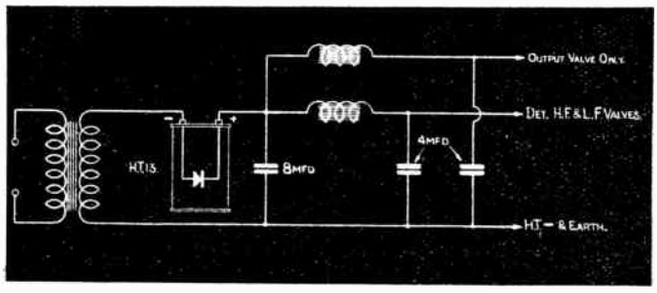

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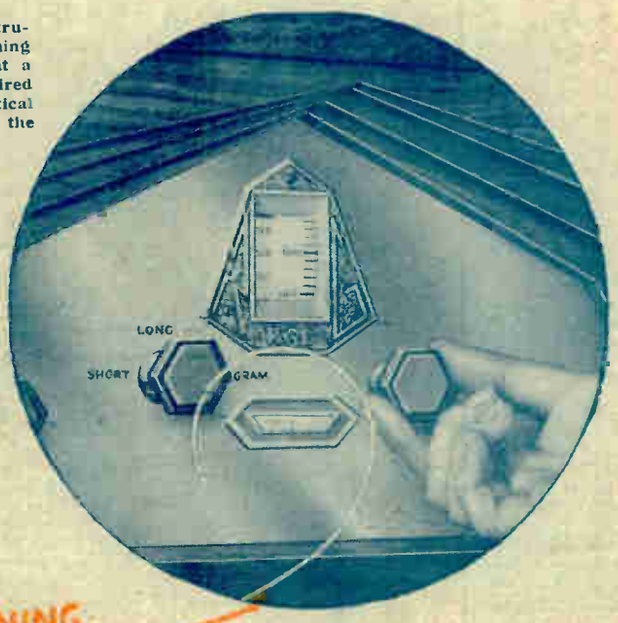

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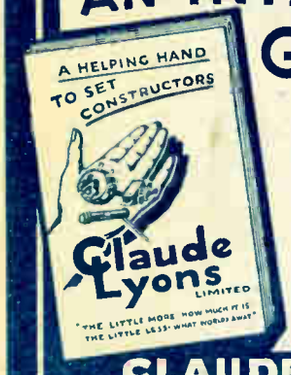

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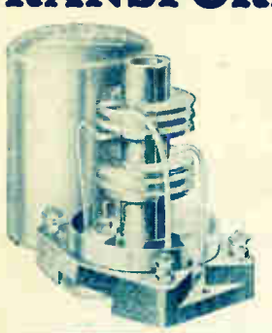

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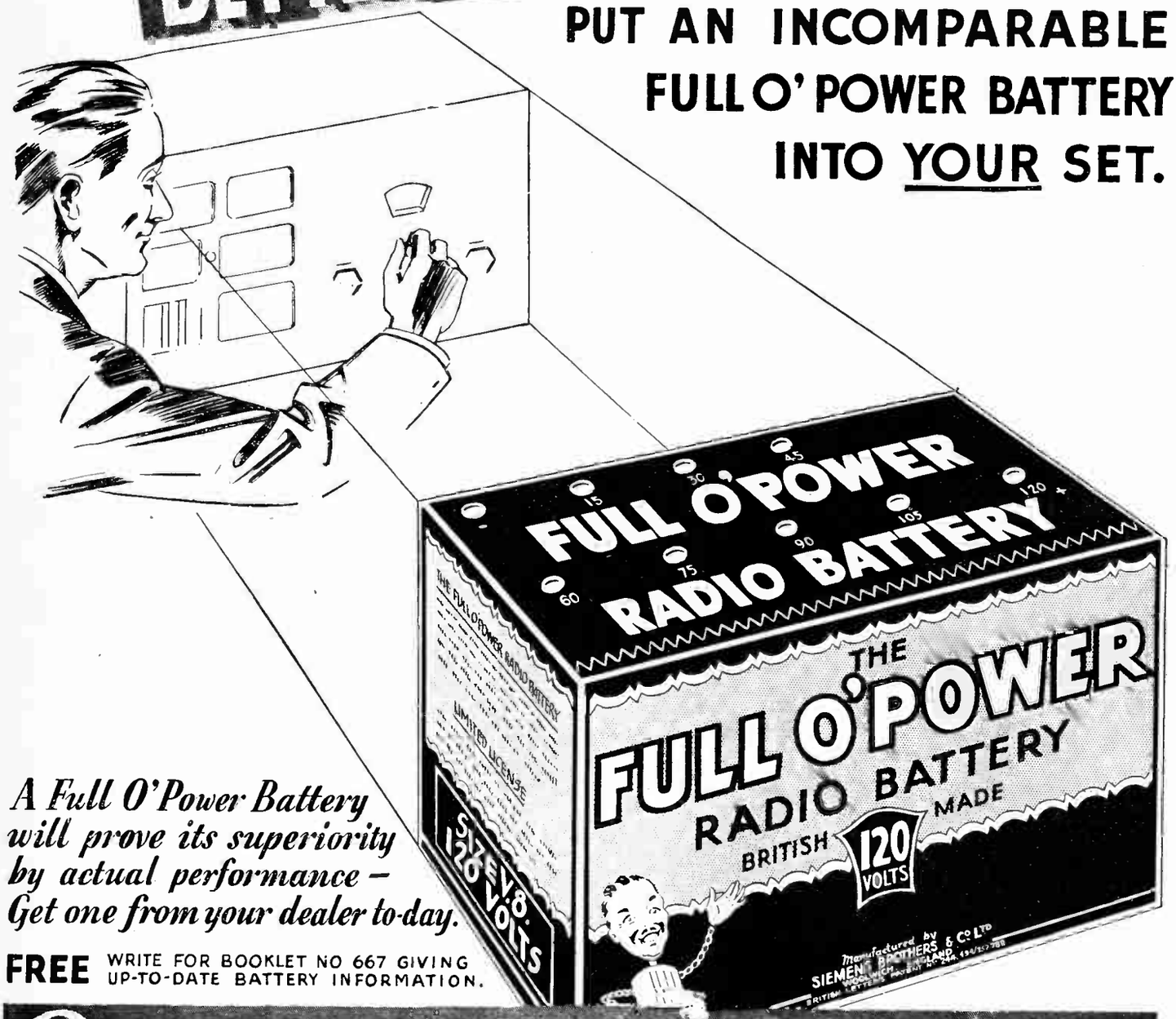

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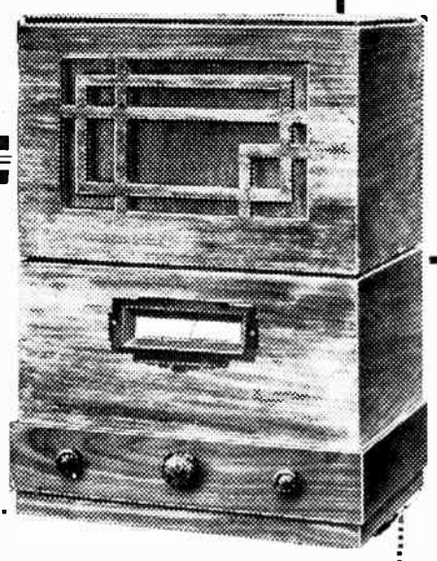

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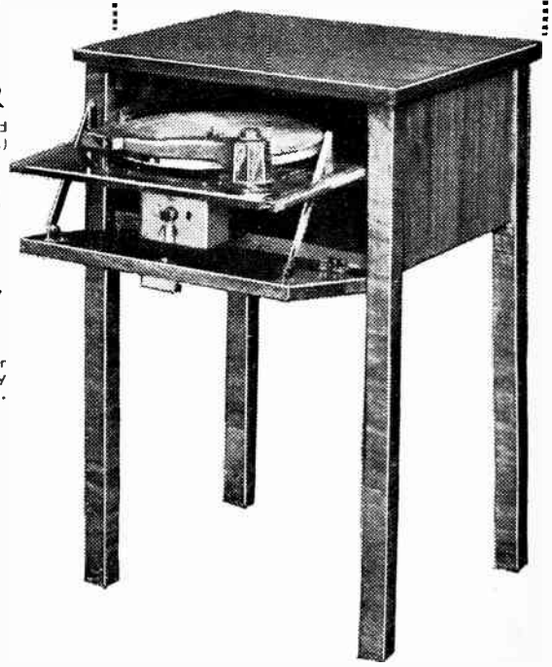

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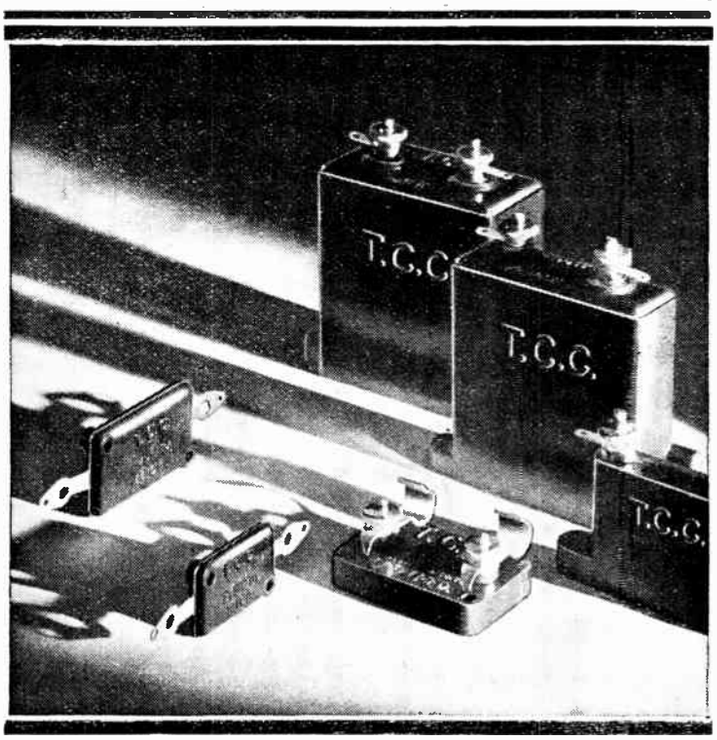

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Research — intensive concentrated research — Creating the means to solve the ever present problems of Radio — Rejecting all but what experience has found 100% right. That is the job of the vast T.C.C. organisation—that is why none but the perfect product finds its way to the storeroom. But even more, that is why T.C.C. spells SAFETY at all times. Throughout the world the "condenser in the green case" is synonymous with condenser efficiency—whatever the need there is a T.C.C. to fulfil it—adequately—the reason for the choice of T.C.C. by all the leading set designers.

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67/6

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All fitted with automatic stop switches.

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HOW WOULD YOU LIKE A NEW H.T. BATTERY EVERY DAY?

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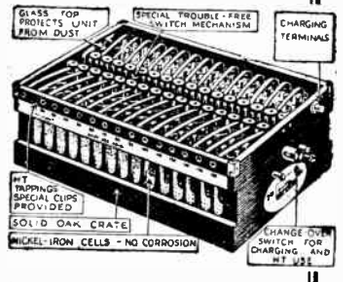
which is always fully charged. Whenever the set is not in use **the Milnes Unit recharges itself automatically from the L.T. accumulator.** The cost, measured in extra L.T. charging, is negligible. The Milnes Unit will last for a lifetime and improves with hard work.

Remember the Milnes Unit has a watt hour efficiency of 65-70% — higher than any other form of H.T. supply.



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A "FOUR" WHICH PULLS TOGETHER for unsurpassed performance in battery sets

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MADE IN ENGLAND

SOLD BY ALL RADIO DEALERS

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Please send me FREE copy of Booklet No. 87, telling me all about the world's Finest Mains Units.

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31/7

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If you do not know who is your nearest Multitone Dealer, please write to us.

(76)

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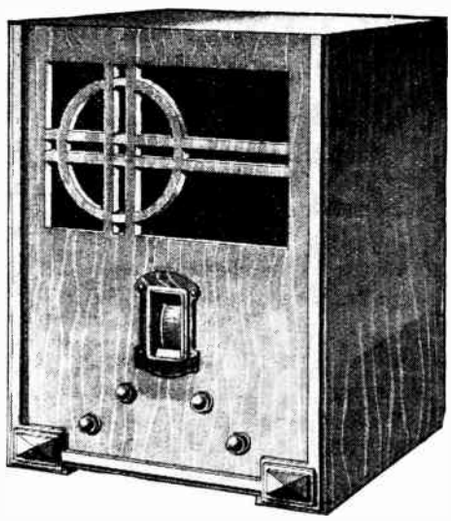
Free to amateur constructors

With every HOBBIES WEEKLY for Nov. 18th now on sale, there is a large free design chart with complete instructions and patterns for making this modern radio cabinet. Details of cost of wood are also given. The design is No. 1987 and copies will cost 4d. each after this week. Hobbies Weekly is full of interesting and helpful articles for the handyman, and is obtainable from any newsagent for 2d. each Wednesday.

This week only



If your newsagent has sold out send 3d. in stamps for a copy to Hobbies Weekly, Dept. 16, Dereham, Norfolk

Important Notice

The M-O. VALVE COMPANY Limited,

who are the Manufacturers of "Catkin" Valves and Registered Proprietors of the Trade Mark "Catkin", No. 535589 and also the Registered Proprietors of Letters Patent No. 378994 give notice to all whom it may concern that in an Action in the High Court of Justice (Chancery Division) between The M-O. Valve Co. Ltd., Plaintiffs, and Super Radio Company (Bradford) Ltd. of 39 Bank Street, Bradford, and the Super Radio Company of 2 Bank Street, Bradford, Defendants (1933, M. No. 2966), upon Motion for an Injunction, the Plaintiffs and the Defendants agreeing by their Counsel that the Motion should be treated as a Motion for Judgment and consenting to that Judgment, the Court granted to The M-O. Valve Co. Ltd. on the 10th October, 1933, an **Injunction** for the life of Letters Patent No. 378994 restraining the Defendants from infringing such Letters Patent by advertising, offering for sale or selling valves manufactured pursuant to the said Letters Patent at prices below the prices fixed by the Plaintiffs.

The Court also awarded The M-O. Valve Co. Ltd. **Costs** and directed an enquiry as to **Damages.**

THE TRADE AND PUBLIC ARE WARNED

that "Catkin" Valves are manufactured under certain Letters Patent (including the said Letters Patent No. 378994) the property of The M-O. Valve Co. Ltd., and such Valves are only licensed for resale in accordance with the conditions of the Limited Licence particulars of which are printed on every carton. Any sale of such a valve in breach of these conditions constitutes an infringement of the Letters Patent and renders the seller liable to an action for damages.

Announcement of The M-O. Valve Co. Ltd.,
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Proprietors : THE GENERAL ELECTRIC CO. LTD. AND MARCONI'S WIRELESS TELEGRAPH CO. LTD.

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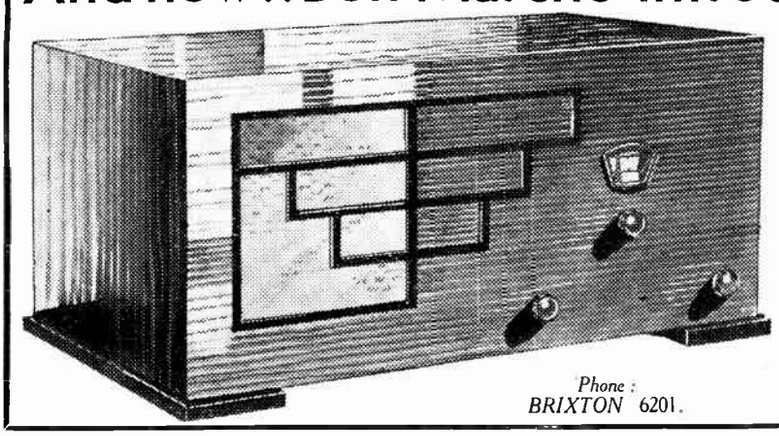
And now..Bon Marché introduce the "Super-Het Five"



Phone: BRIXTON 6201.

This Receiver—exclusive to Bon Marché—can justifiably be called an achievement. It combines all the features of 1934 Radio in an entirely new Walnut-finish Cabinet, yet is offered at the economical price of 13 Gns. The "S.H.5" is very easy to operate, and gives a depth of tone which sets a new standard for Radio reception—*Hear it to-day!*

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- Remarkably selective Super-het Circuit.
- 5 Mullard Valves (including Rectifier).
- "Magnavox" Moving Coil Speaker.
- Mains aerial device and provision for Gram Pick-up.
- Wavelength-marked Tuning Dial, one knob control. Long and medium wave bands.
- Modern style Walnut finish Cabinet, 22in. by 12in. by 10in.

CASH PRICE 13 Gns. *or* 18 Monthly Payments of 16/4

NO DEPOSIT REQUIRED. FIRST MONTHLY PAYMENT SECURES DELIVERY.

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NEWS! An automatic Record Player which eliminates all the nuisance of gramophone manipulation!

It incorporates the well-known Collaro "Empire" Self-starting Induction Motor and the Collaro "No. 20" Pick-up.

Records of any size are inserted in the "letterbox" slot. This switches on the current. When finished playing, the current is switched off and the record automatically returned.

At present available for A.C. only—a D.C. model will be ready shortly. Can be supplied for all frequencies from 25-100 cycles. Every machine is fitted with a patented universal voltage switch block which allows the motor to be switched over instantly from 100-130 to 200-260 volts and vice versa. The consumption of the motor is about 20 watts.

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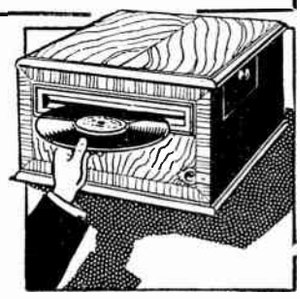

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TONE CORRECTOR CHOKES.

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CUT OUT WHISTLES, SIDEBAND SPLASH

WITH THE 'KINVA' FILTER.

Two highly developed types, for use in Detector or L.F. Anode of any Set. Type A.3 Super Filter, 3,500 cut-off, **13/6.** Type 'D' 2-range, 3,500 or 5,000 cut-off, **7/6.**

Complete with Instructions. (Lists Free.)

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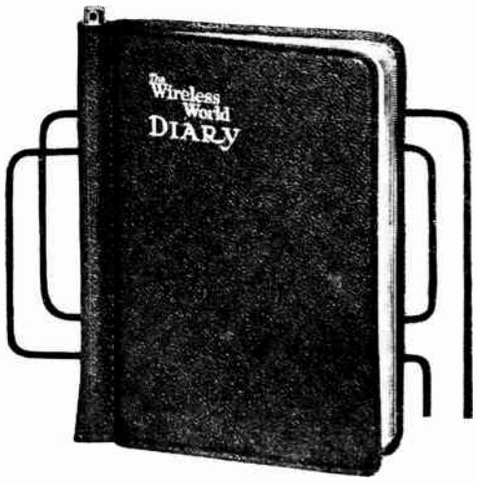
The Wireless World DIARY for 1934



Compiled by the staff of "The Wireless World"

As a convenient source of information on many aspects of wireless theory and practice, this handy little Diary, now in its tenth year of publication, is unique. In addition to the usual diary pages—one week at an opening—there are 78 pages of facts, figures and explanations. These include sixteen pages of circuit diagrams of complete receivers and details of receivers, including battery economy circuits dealing with Class B, QPP, and other methods, and devices for suppressing mains interference.

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EDISWAN

MANUFACTURERS & PURVEYORS OF ELECTRIC LAMPS BY APPOINTMENT

Again for technical men

THE MAZDA PD. 220

14/-

This valve operates without bias on the grid, and thus simplifies the wiring of the set. It will deliver an exceptionally high power output for a very economical anode current and filament current consumption.

THE MAZDA PD. 220A

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This valve operates with bias, and is most suitable for those who require the utmost quality and do not mind the little extra trouble in order to procure it. It is extraordinarily efficient although the quiescent feed current is a little higher than in the PD.220.

IF you are constructing a modern Battery Set this winter, you *must* use "Class 'B' output." As you know, it is recognised to be the only means of procuring mains set volume and quality with the minimum of H.T. consumption.

We offer you two types of Class 'B' Valves; the Mazda PD.220 and the Mazda PD.220a.

Both of them will operate a moving coil speaker at ample volume from a driver valve of medium capacity, and they will handle the output without a trace of harshness.

Your dealer has these valves in stock, and can give you further details, or you can write to the Valve Service Dept., who will be pleased to send you full information and circuit diagrams.

When choosing your components, the following table will be of use to you:—

RATING & CHARACTERISTICS.	The Mazda L 2 Driver.		The Mazda P.220 Driver.	
	Mazda PD.220	Mazda PD.220A	Mazda PD.220	Mazda PD.220A
Anode Volts	135	135	135	135
Grid Bias Volts	0	-5.5	0	-5.5
Anode to Anode Load (Ohms)	16,000	13,500	11,500	10,000
Driver Trans. Ratio (overall)	2.0:1	1.35:1	1.6:1	1.2:1
Total Quiescent Anode Current (Ma)	1.5	2.0	1.5	2.0
Driver input Volts. (R.M.S.)	2.9	2.9	4.85	4.85

Some take chances . . .

OTHERS BUY-

MAZDA

THE SAFETY VALVE

Mazda Radio Valves are manufactured in Great Britain for The British Thomson-Houston Co. Ltd., London and Rugby.

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"I notice that several of the Sets described in the Radio Press specify DAVENSET Chokes and Transformers. If they are good enough for the experts they are certainly good enough for me. And besides, I notice that Davenset Engineers specialise in making to individual specification. Let's tell them what we want."

DAVENSET **CHOKES AND TRANSFORMERS**

PARTRIDGE WILSON AND COMPANY

Dept. 29, Davenset Works, LEICESTER

SCOTTISH BRANCH: 200, St. Vincent Street, GLASGOW, C.2.

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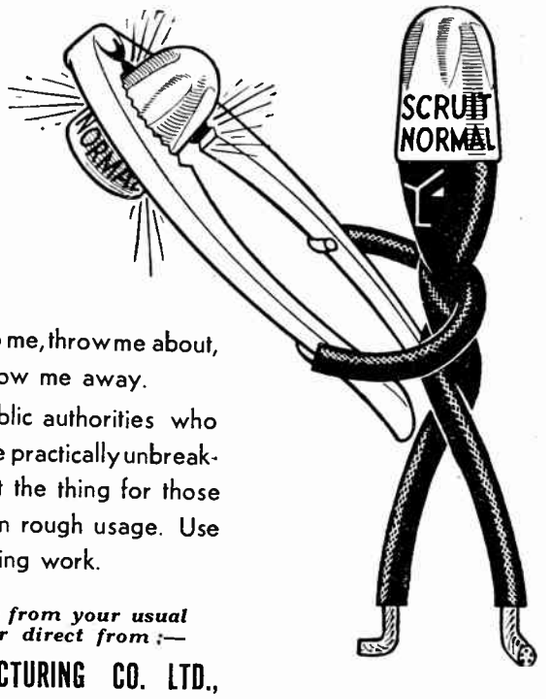

Twist me, drop me, throw me about, but *never* throw me away. Tested by public authorities who have found me practically unbreakable. I'm just the thing for those jobs that mean rough usage. Use me on all wiring work.

Obtainable from your usual supplier or direct from:—

V.G. MANUFACTURING CO. LTD.,
Gorst Road, Park Royal, London, N.W.10.
Telephone: Willesden 1632.

SCRUIT MIDGET AND NORMAL CONNECTORS

Baffle that "Boom"!

The B.B.C. Way.

THERE is no need to put up with that annoying "boominess" in your loudspeaker, which so often spoils your enjoyment of an anticipated programme.

The Howe Box Baffle doesn't cure it. Acoustically perfect, it prevents it and makes it quite impossible for resonance to develop in any loudspeaker.

Unless your loudspeaker is perfect you cannot hope for perfect reproduction, no matter how elaborate your set.

Follow the lead of the B.B.C. Every loudspeaker in Broadcasting House is fitted with a Howe Box Baffle. You can fit one to your existing loudspeaker. Once fitted you'll wonder why you have gone on so long without one.

Complete Baffles from 30/-.

Let us send you details FREE.

USED IN THE B.B.C. STUDIOS

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ALL BRITISH

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The name that means 'EXCELLENCE'

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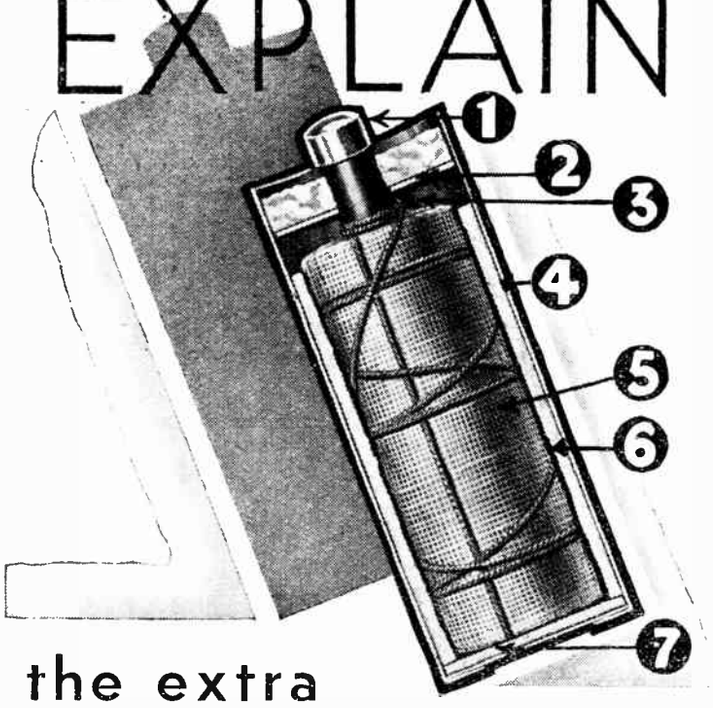

the extra service you get from EDISWAN H.T. BATTERIES

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You can get Ediswan Batteries in all standard sizes including portable types — Standard or Super Capacity — at the usual price.

THE EDISON SWAN ELECTRIC CO. LTD.
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EDISWAN-the Better Service Batteries

B256

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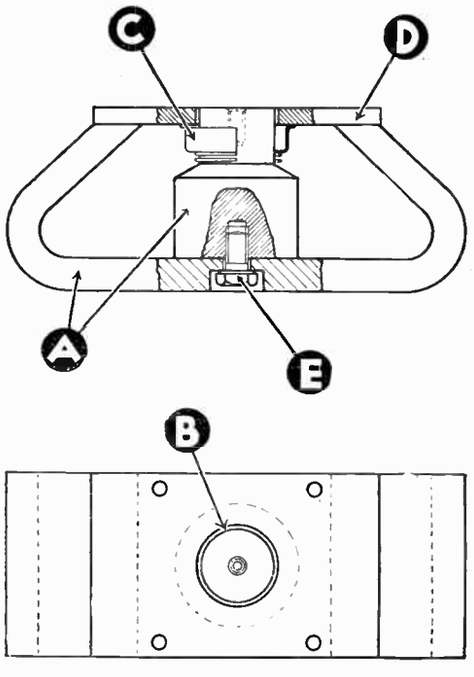
Darwin PERMANENT MAGNETS FOR MOVING COIL SPEAKERS

No. 3 COMPOSITE TYPE



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B Patent heat treatment providing flux concentration which has previously been impossible.

C Patented dust cover to prevent entry of foreign matter to air-gap.

D Welded outer pole by Patent process ensuring no distortion of gap due to shock.

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Our Technical Staff is always available to assist in solving any magnet problem, and can materially assist in economies in magnet steel for a given output and performance.

Darwins Ltd

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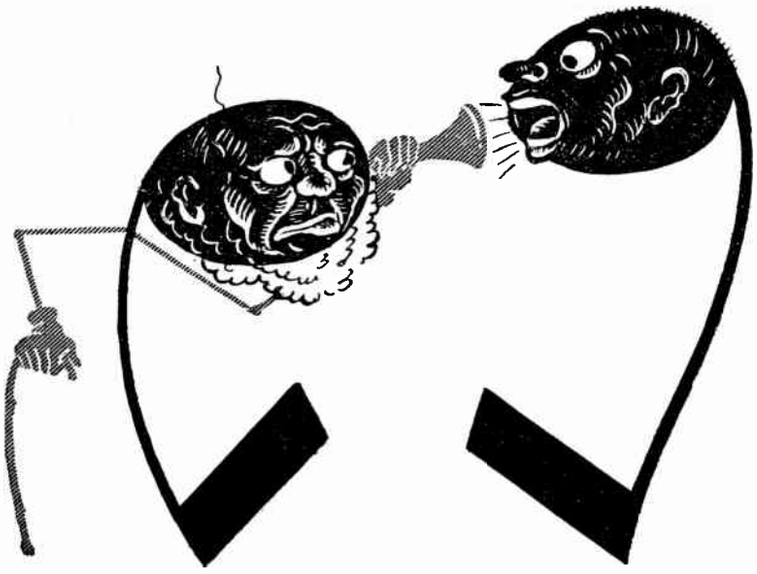

The rude young Note, shouting: "I said Tungsram SYMPHONIC *valves, you old chump! Tungsram's latest discovery for rejuvenating old sets! I reckon you could do with a course of them yourself!"*

TUNGSRAM introduce

their **SYMPHONIC** valves

Just released after months of unceasing research by our laboratories! Tungsram new Symphonic high efficiency valves! Try them in your set. No circuit alterations are necessary. They improve Volume, Sensitivity and Quality remarkably.

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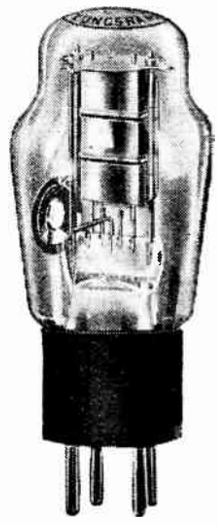
Symphonic Detector	*AR* 4101
Symphonic Multi Grid Output	*APP* 4120

Ask your Dealer or write our Technical Dept.



TUNGSRAM

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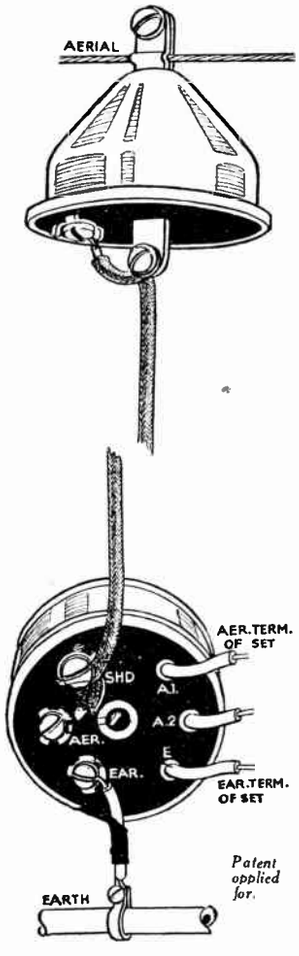

Patent applied for.

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The RADIOFORMER really does the job—cuts out local interference caused by electrical apparatus of all kinds.

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Compiled by S. O. Pearson, B.Sc., A.M.I.E.E., and Issued in conjunction with "THE WIRELESS WORLD"

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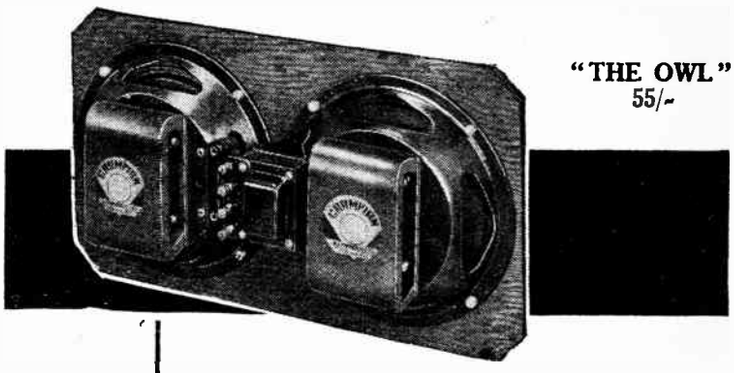

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As many of the circuits and apparatus described in these pages are covered by patents, readers are advised, before making use of them, to satisfy themselves that they would not be infringing patents.

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EDITORIAL COMMENT

Broadcasting and the Record

A Defence of B.B.C. Policy

THERE has been some criticism of the B.B.C. recently for the extended use of recordings for broadcasting. There has it seems been one instance (probably many more) where the B.B.C. has mixed in recorded items with direct broadcasting before the microphone. There does not seem to be any particular objection raised by the critics to broadcasting gramophone records where the listener is told that what he is listening to is, in fact, a record. The critics are, it would seem, questioning the desirability of putting over a recorded item without disclosing the fact to the public.

There are, of course, quite strong arguments which can be put forward on both sides, but we are inclined to think that the B.B.C. can very largely justify its policy, provided that in every instance there is a reason for substituting the record for the direct broadcast.

The Case of Plays

A former Director of Broadcasting in Berlin held strong views on this subject; he believed that musical works should, generally speaking, not be broadcast through the medium of a record except where questions of programme costs made it difficult to give a direct rendering. He inclined very strongly to the view that, for many broadcast items, and particularly for plays, the transmission from a studio recording was to be preferred to a direct performance. He gave as his reasons that many rehearsals might be carried out before a really satisfying performance was given, where no hitch of any kind occurred and where all the performers were at their best. This, he considered, was the moment to seize and to record because very likely a direct performance would suffer from defects at the particular time that it was given. Actors might be indisposed and their voices suffer in consequence, or hitches might occur in the stage production itself.

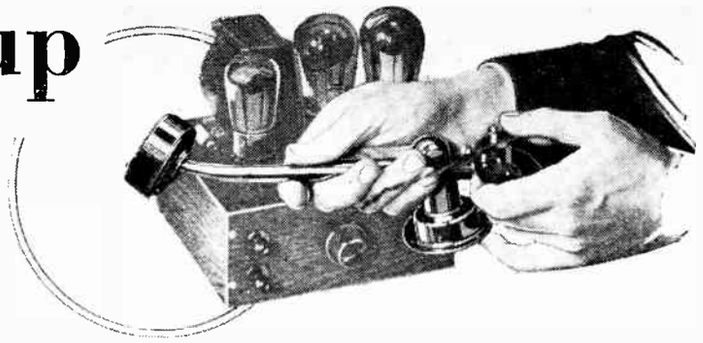
Records a Valuable Asset

When the B.B.C. has made use of recording, we think it probable that this has only been done where the performers or speakers could not have been present in person at the time the broadcast was made. The risk which must be guarded against is the possibility that recording might come to be regarded as a ready substitute for the real thing, and here, particularly in the case of musical performances, quality would undoubtedly suffer. It would be disastrous for the B.B.C. thus to lower the standard of transmission quality, even though it must be admitted there are still comparatively few sets in the hands of listeners which are capable of doing full justice to the best quality which the B.B.C. puts out.

Any critic who argues that the B.B.C. should discontinue the use of recording as an adjunct to broadcasting is, in our opinion, proposing to deprive broadcasting of one of its most important assets. The record and other artificial devices are used extensively for the production of outside noises and effects, many of which it is difficult, if not impossible, to reproduce on the stage. Broadcasting should make every legitimate use possible of this aid, and it must be left to the good sense of programme producers to see that it is not abused.

Fitting a Pick-up

How to Adapt Existing Sets for Gramophone Reproduction



THIS article, written for the wireless user who has not previously attempted to reproduce gramophone records through his set, shows that the necessary alterations are of the simplest nature. Both permanent and temporary conversions are discussed.

IT is strange that the average owner of a receiver, when considering the question of modifying it for gramophone reproduction, seems to suffer from what is nowadays called an inferiority complex. Actually, there is seldom any reason why the low-frequency portion of a good receiver should not also be a good amplifier for the purpose of reproducing records; from the point of view of convenience, the modified set can be made, by the exercise of ingenuity, at least as good as the conventional self-contained radio-gramophone. If, on the other hand, nothing more than occasional reproduction of gramophone records is required, a temporary "hook-up" may be improvised with small trouble and expense.

Almost every type of receiver is easily convertible, except, perhaps, those few sets of ultra-modern design in which a diode detector (or an H.F. metal rectifier) feeds directly into the output stage; with these sets considerable modification may be necessary, as it is generally essential that one of the earlier valves should be converted from its original purpose (probably that of I.F. amplifier) into an L.F. amplifier.

Nowadays, it is not far short of the mark to say that ninety-nine per cent. of sets include grid detection. All of these can be fitted with a gramophone pick-up with the greatest of ease, and with the virtual certainty that gramophone records will be reproduced just about as well as radio signals. Before discussing the pick-up and various other accessories that will be required it would be as well to put on record the various ways in which the minor circuit alterations necessary may be effected.

Basically, all we have to do is to make arrangements to join the pick-up, in series with a source of grid bias, between grid and filament of the first L.F. amplifier of the receiver. At the same time, provision must be made for clearing away any existing apparatus already connected to this circuit which might prejudice the operation of the pick-up. In practice, we will also need a volume-control device of some sort, as modern sets seldom include provision for regulating L.F. amplification. Neither does the modern set include an intermediate L.F. stage; therefore, the detector valve (which nearly always performs the function of amplifier as well) must be pressed into service as a gramophone amplifier, and the pick-up will be connected to it in the manner indicated in Fig. 1 (a). This represents almost the standard arrangement for battery sets; the fact that the grid leak and the grid condenser are effectively in parallel with the pick-up seldom has any prejudicial effect on performance. A switch is fitted for convenience, in order that the pick-up circuit may be connected to, or isolated from, the valve grid at will.

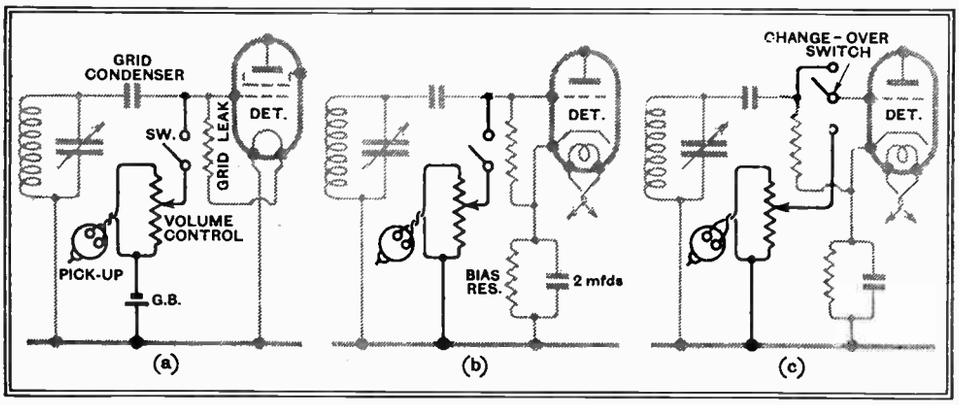


Fig. 1.—Methods of fitting a pick-up to both battery and mains receivers.

This, in the simplest terms, represents the normal way of connecting a pick-up, and is applicable either to battery or mains sets. In the mains set, however, it will almost always be desired to replace battery bias by automatic bias; this can be done by adopting the circuit arrangement of Fig. 1 (b). Here we have a beautifully simple and entirely automatic arrangement, whereby the operating conditions of the detector grid are varied to suit the particular function which that valve has to perform.

Battery or Automatic Bias

With regard to the actual value of grid bias voltage, it will almost always be correct to use a pressure of 1½ volts with battery sets. Indirectly heated mains valves require more bias, and as a rule three volts will be enough; when automatic bias is to be employed, a resistor of about 1,000 ohms connected in the cathode lead, as shown, will almost invariably be right.

Another method of fitting a pick-up is shown in Fig. 1 (c). This differs only from those already discussed, in that a change-over switch is used, by means of which the "radio" components in the grid circuit are completely disconnected for gramophone reproduction. In special circumstances this plan has its advantages, but it is perhaps not so generally suitable for indiscriminate use as the simpler arrangement, and involves more disturbance of existing wiring.

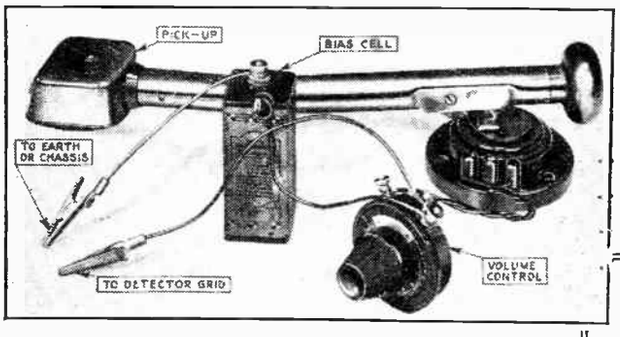
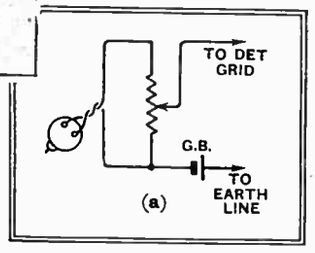


Fig. 2.—A simple way of adding a pick-up for temporary use.



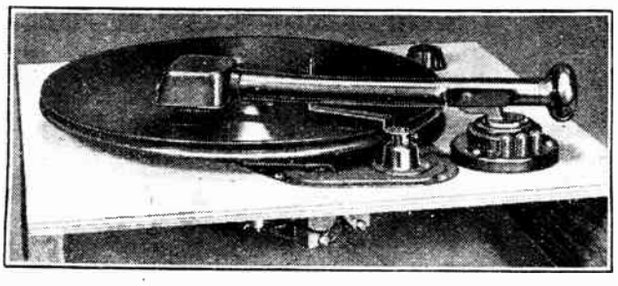
Any set not more than two or three years old may with the greatest of con-

Fitting a Pick-up—

fidence be modified on one or other of these plans, even if one has no precise information as to the circuit arrangement employed. Anode-bend detection need hardly be considered nowadays, although the arrangement of Fig. 1 (c) is basically applicable either to battery or mains sets.

Another type of receiver requiring special treatment is that with diode detection, but fortunately there is no great difficulty here. All diode sets, except those of the very latest type mentioned in the first paragraph, have an intermediate L.F. stage, and all one has to do is to connect pick-up and volume control across the grid circuit of the L.F. amplifier which immediately succeeds the diode. At the same time, arrangements must be made to isolate the diode from the pick-up. More often than not this is most conveniently done by interrupting the filament circuit; the valve when cold will exercise no harmful effect on the pick-up characteristics.

Whatever method of fitting a pick-up is employed, it is always wise to try to mount the radio-gramophone change-over switch as close as possible to the valve with which it is associated. Long, straggling leads are likely to introduce instability, and are certain to add to the stray capacity existing across the detector grid circuit. Occasionally it will be impossible to put the former precept into practice, and to prevent uncontrollable self-oscillation it may be necessary to screen the lead which runs from the detector grid to the switch; this screening, if necessary, should be done with comparatively thin wire in wide-bore sleeving covered with metallic braiding. In any case, the addition of a pick-up will almost



A "record playing desk" in its simplest form. The essential accessories are, pick-up, motor, turntable, and volume control.

invariably call for a slight readjustment of the detector grid circuit trimmer in ganged sets; in superheterodynes a corresponding adjustment of the condenser which tunes the last I.F. transformer secondary will be needed.

For a temporary conversion, the method of fitting a pick-up shown in practical form in Fig. 2, and theoretically in the inset diagram (a), is generally convenient. A connection to the earth line (H.T negative) is always accessible, and similarly it will generally be easy to make a connection to the detector grid by means, say, of a spring clip, as shown. If, however, the wiring of the set is inaccessible, it will be convenient to use a "split grid adaptor" as in Fig. 3. This is a truly universal arrangement, as by the interposition of the adaptor the valve grid is entirely isolated from the internal wiring, and so may be joined to any pick-up circuit. There is no harm in leaving the adaptor always in position; to revert to radio-reception, the pick-up lead is removed from the upper terminal and the two adaptor terminals are then bridged by a link.

It is a matter of some importance that

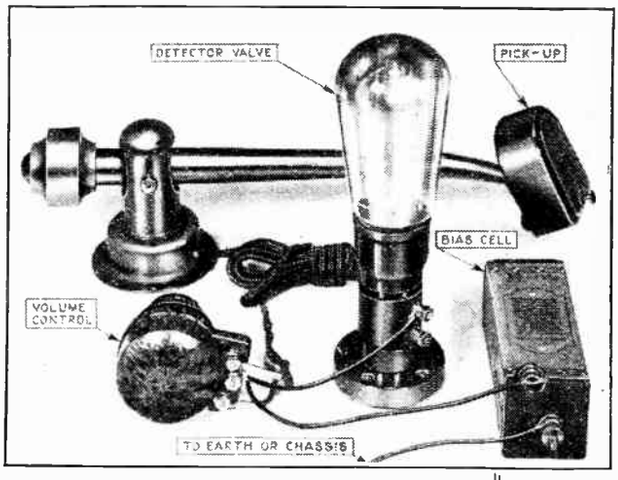


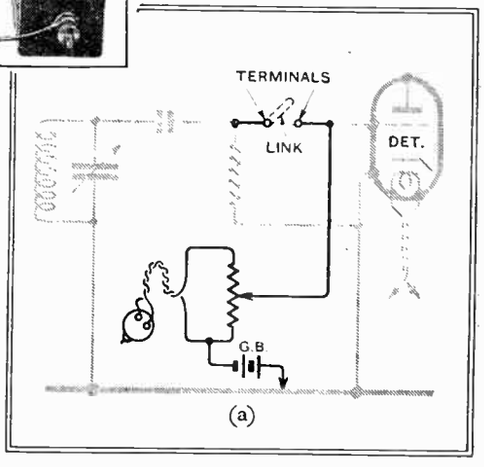
Fig. 3.—Another method, of almost universal application; connection with the valve grid is picked up through an adaptor (Bulgin).

the correct value of volume control potentiometer be employed. Many pick-ups, as, for example, the Blue Spot, Celestion and Cosmochord, are always sold with a built-in potentiometer, and so the question of choosing the right value does not arise. With others the makers' recommendation should be followed; failing information on this subject, the rule is that the higher the impedance of the pick-up, the higher should be the value of the shunt resistance. Too low a value will introduce attenuation of high notes, but this effect may sometimes be turned to good account; when high notes are over-emphasised a measure of tone correction may be introduced by using an abnormally low value of potentiometer. As a guide to the values in customary use for well-known pick-ups, the following list is given: Marconiphone (latest model), 50,000 ohms; B.T.H. Senior, 20,000 ohms; B.T.H. Minor, 10,000 ohms; Bowyer-Lowe, 50,000 ohms; Limit and Limit Reliance, 250,000 ohms.

Rotating the Record

So much for the electrical aspects of adding a pick-up. The mechanical side is fairly simple; we need a turntable for the record, and also a motor to rotate it at a steady speed (usually 78 r.p.m.). Where no mains are available clockwork motors must be employed; these are now extremely satisfactory, but, for obvious reasons, an electric motor is preferable. With D.C. supplies there is no alternative to the commutator motor, which is usually of the universal type, and so may be used on A.C. if a change-over should be made in the future. Motors intended for A.C. only may be either of the synchronous type, of which the speed depends on the mains frequency, or of the induction type, which allows a certain variation of speed. These two principles are combined in the B.T.H. "Truspeed" motor. Other well-known makes are Collaro, Garrard, and Simpson's Electricals.

For intermittent use, the turntable of an old acoustic gramophone will prove satisfactory; with a pick-up like the Harlie, which is designed to fit into the tone-arm in place of the usual sound-box, records may be reproduced electrically without any trouble. For portable gramophones, a very convenient attachment device, with volume control,



is supplied with the Belling-Lee pick-up.

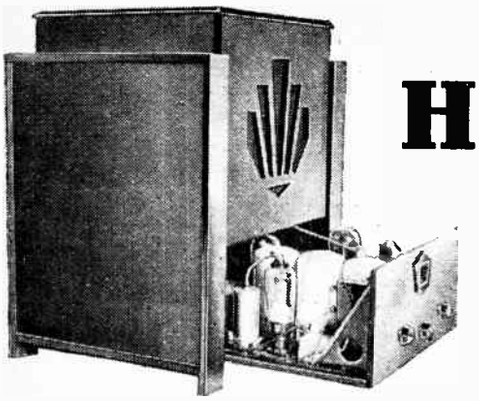
All motors are supplied with the necessary fittings, and so installation is an extremely simple matter, as there is nothing to do but to mount the turntable above, and the driving motor below, a horizontal board, and then to fix the pick-up in the correct position with respect to the turntable spindle. In order to obtain correct tracking, the pick-up maker's advice should be followed implicitly; usually a template is supplied, and so there is no risk of error.

There is scope for ingenuity in the arrangement of the gramophone reproducing apparatus, and many users will prefer to mount these accessories in some form of "playing desk" like the devices described elsewhere in this issue. All sorts of refinements are, of course, possible; for instance, those who develop a keen appreciation of gramophone music will probably not rest content until they have installed an automatic record changer. These ingenious devices, of which a good example is made by Garrard, have now reached a high state of perfection.

In addition, the fitting of a number of small "gadgets," such as needle cups, indicating lamps, etc., which add to the convenience of record reproduction, may be considered; devices of this sort are made by Regent Fittings and Bulgin.

Practical HINTS and TIPS

AIDS TO BETTER RECEPTION



A cabinet, built by a reader, which combines easy accessibility for experimental purposes with the usual features of the modern domestic set.

AS most readers will be aware, the expression "modulation hum" is applied to a particular form of interference which manifests itself only when a carrier wave is being received. The trouble has of late been largely overcome by the fitting of a metallic shield between the primary and the various secondary sections of the power transformer used in A.C. mains sets.

Screened Power Transformers

In order that this screen or shield may be entirely effective, it is a matter of considerable importance that care should be taken in the arrangement of the mains leads. These wires should never be passed in close proximity to the tuned circuits of the receiver or to the aerial; otherwise the transformer screen may be virtually short-circuited, as the interference may be induced directly into the circuits.

IT is perhaps fortunate that the commonest kind of fault to which fixed condensers are subject takes the form of a complete short-circuit between the two sets of plates or foils. Such a defect is easy to find; everyone knows that a fixed condenser *should* show a lack of continuity when tested with D.C. But there is another, and happily less common, fault which sometimes occurs, and which is very much harder to locate. Occasionally an internal disconnection will develop between a terminal and the plates; tested in the ordinary way, a condenser in which this defect exists will naturally show perfect insulation, but nevertheless will be quite useless.

Fixed Condenser Tests

A common test for both insulation and internal connections of large capacities is to charge the condenser by connecting it across a source of high tension D.C. voltage, and then to discharge it by bridging the terminals with a piece of metal. The production of a spark will indicate that everything is probably in order.

But this test is not applicable to small condensers, and for testing them thoroughly a pair of phones and a small dry battery are usually recommended. These are connected in series across the condenser under suspicion, and, if everything is well, a click, due to the flow of charging current, should be heard on completing the circuit. Any click heard at the moment of interrupting the testing circuit is an indication of serious leakage, or of a complete short-circuit, while the absence of a click at "make" shows an internal disconnection. The smaller the condenser, the more difficult it is to make this test, and now that headphones have gone out of general use, it is perhaps not an entirely practicable one to suggest. A sensitive loud speaker may, however, replace the phones with fairly satisfactory results.

Another test is made by joining a sensitive measuring instrument—preferably a voltmeter—in series with an H.T. battery and the condenser. If everything is in order there will be a momentary deflection of the meter needle as the charging current flows into the condenser. A continuous deflection is indicative of leakage, while no deflection shows an internal disconnection. The weak point about this test is that it is only applicable to condensers of fairly high capacity—say not much smaller than 0.1 mfd.

WHEN automatic bias first came into use it was customary to obtain the necessary negative voltage from the drop in potential across a resistor connected in the negative H.T. lead; in such a position, in other words, that the anode current for all valves in the receiver flowed through it. This meant, of course, that the H.T. voltage available for the anode circuits of the set itself was reduced by the amount of voltage lost in the bias resistor.

Volts for Automatic Bias

It is not surprising, therefore, that a tradition seems to have grown up that the true H.T. voltage will be that available from the power supply unit, less the amount of bias required for the output valve. So far as the output valve itself is concerned, this will still be true, but it must be remembered that, with the modern type of self-biased circuit, where each individual valve is biased by the flow of its own anode current through a resistor, there is no loss of voltage, except in so far as the individual valve is concerned.

Imagine a power supply unit, delivering current at 280 volts under working conditions, and feeding a set with an output valve requiring 30 volts bias. The actual pressure available for this valve will therefore be only 250 volts, but the full 280 volts, less perhaps two or three volts for bias, will still be applied to all the earlier valves, unless suitable means are taken to absorb some of them.

AS many builders of "H.F." sets have found out by bitter experience, the tendency towards uncontrollable self-oscillation is generally most marked at low wavelengths. On increasing the capacity of the tuning condenser of an unstable set, the unwanted oscillations become less and less strong until a point is reached—often at about 400 metres—where the receiver becomes completely stable.

Unwanted Inter-circuit Couplings

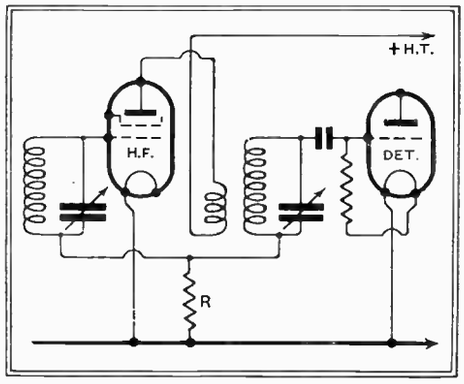


Fig. 1.—The resistance R represents an unwanted inter-circuit coupling, which might be introduced by a badly made earth connection on the ganged tuning condenser.

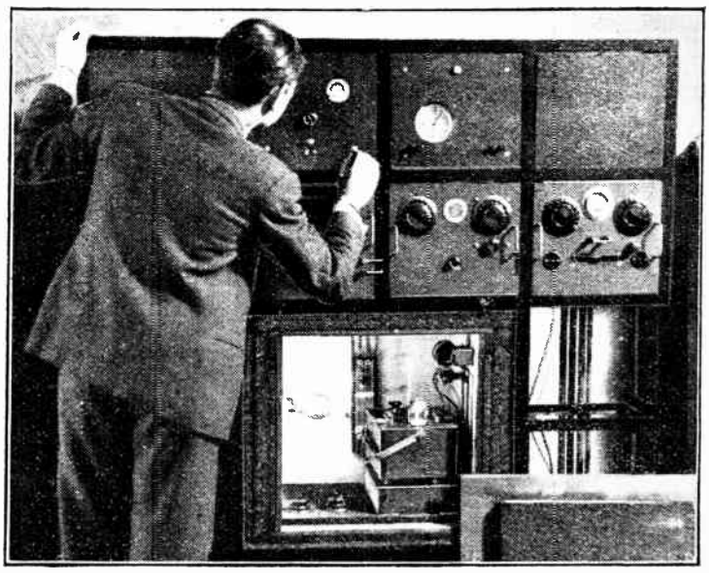
But occasionally partial instability manifests itself in the opposite way, and "patchy" self-oscillation will be encountered over a wide band of wavelengths between, perhaps, 400 and 500 metres. At lower wavelengths, and perhaps also at the extreme upper end of the wave range scale, there may be perfect stability.

It is useful to remember that effects of this latter kind are more often than not traceable to an unwanted resistance which is common to two or more oscillatory circuits. A badly earthed tuning condenser frame can, as mentioned last week, be responsible for instability; it may cause this trouble through high ohmic resistance in the earthing connection. The effect of this resistance will be understood by considering the skeleton circuit diagram reproduced in Fig. 1. In this diagram the resistance R, representing a high-resistance contact, is in series with the "return" leads of both the H.F. and detector grid circuits; the latter is, in effect, equivalent to the anode circuit of the H.F. valve, and so it is not hard to see that interaction of this nature may cause instability.

How Europe Will Re-tune

Calibrating "By Numbers" on January 14th and 15th.

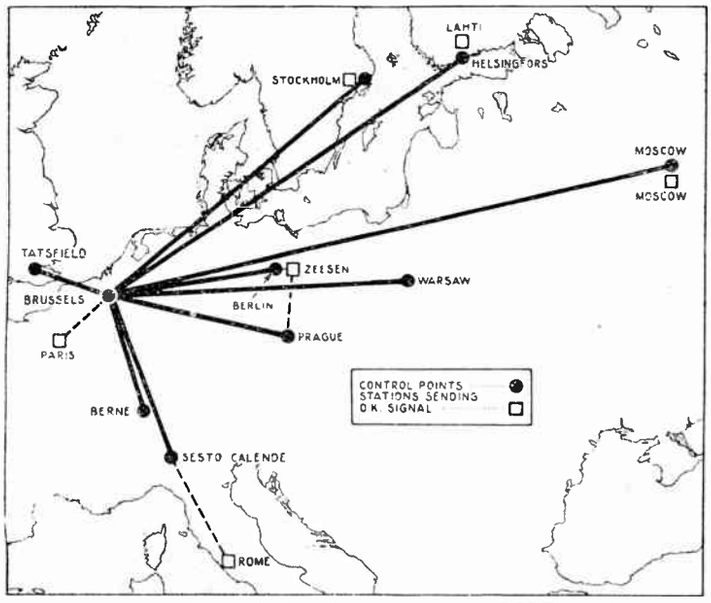
TO avoid a repetition of the comparative chaos which followed the inauguration of the Prague Plan six years ago, the International Broadcasting Union has devised an elaborate system with which it is hoped to effect a smooth change-over to the Lucerne Plan in January next. This article describes the procedure at Zero Hour on the 14th



The master wavemeter at the Brussels control station. By this instrument all other European wavemeters are checked.

IT is now possible to reveal the arrangements under which the great change-over of wavelengths in accordance with the Lucerne plan will take place in January next. All European stations will cease transmission at or before 11 p.m., G.M.T., on January 14th, 1934. Then, one by one, according to special schedules now being prepared, the stations will resume broadcasting on their new wavelengths. These will be checked systematically by one or other of the ten official control points.

Immediately a control station has completed its measurements of the frequency of a transmitter, the fact will be announced over one of five high-powered stations specially selected by the International Broadcasting Union. This will be the medium of communication between the control stations and the transmitters.



All European stations will close down at 11 p.m. (G.M.T.) on January 14th. Then stations in each of five main groups will resume transmission one by one on their new wavelengths. As the map indicates, Brussels will form the hub of the system.

To assist rapid identification, each transmitter will broadcast its name and country at least every two minutes during its transmission period. The transmissions will consist of gramophone records of which the titles will have been previously communicated to the control posts.

As can be seen from the accompanying map, Brussels will be the nerve-centre for the entire change-over.

By special arrangement made at the Amsterdam meeting of the International Broadcasting Union, the Postal Administrations will supply long-distance telephone lines, free of charge, for communication between the control points on the two nights of the change-over.

It may be wondered why each station will not change its wavelength by means of its own wavemeter, as was done previously when the Prague plan was introduced in 1927. However, bitter experience at that time showed that a much more rigid central control was necessary, especially as the majority of the stations in Europe have wavemeters of doubtful veracity. Moreover, it is much more effective to check the wavelength at a distance where interference with neighbouring stations can be more speedily detected than by station officials themselves.

Listeners who are prepared to sacrifice some sleep should have an excellent opportunity of calibrating their sets on the nights of January 14th and 15th.

In the following lists are shown the control stations and the countries whose transmitters they will check, and also the high-power station announcing the results of the measurements:—

Control Stations: BRUSSELS, TATSFIELD. Stations to be checked: Belgium, Spain, France, Great Britain, Ireland, Iceland, Luxembourg, Morocco, Holland, Portugal, Switzerland. **Station transmitting results of measurements:** Radio Paris.

Control station: BERLIN (REICHSPOST-ZENTRALAMT). Stations to be checked: Germany, Denmark, Poland. **Station transmitting results of measurements:** Zeesen (Konigswusterhausen, Deutschlandsender).

Control station: PRAGUE. Stations to be checked: Austria, Hungary, Roumania, Czecho-Slovakia. **Station transmitting results of measurements:** Zeesen (Konigswusterhausen, Deutschlandsender).

Control Station: HELSINKI (HELSINFORS). Stations to be checked: Esthonia, Finland, Latvia, Lithuania. **Station transmitting results of measurements:** Lahti.

Control station: MOJAISK. Station to be checked: U.R.S.S. **Station transmitting results of measurements:** Moscow.

Control station: SESTO CALENDE. Stations to be checked: Italy, Turkey, Yugoslavia, Algeria, Tunis, Egypt. **Station transmitting results of measurements:** Rome.

Control station: STOCKHOLM. Stations to be checked: Sweden, Norway. **Station transmitting results of measurement:** Stockholm.

All these control stations will be interconnected by telephone. The use of the control stations at Berne (Switzerland) and Warsaw (Poland) will be made known at some later date.

British listeners tuning in Radio Paris after 11 p.m. will hear that station calling up various transmitters in turn in the eleven countries under the control of Brussels and Tatsfield. Similarly, they will hear Rome monitoring the transmitters in the south, while Zeesen superintends Central European transmitters.

"WANDERING WAVE."

Radio-gramophone Conversions

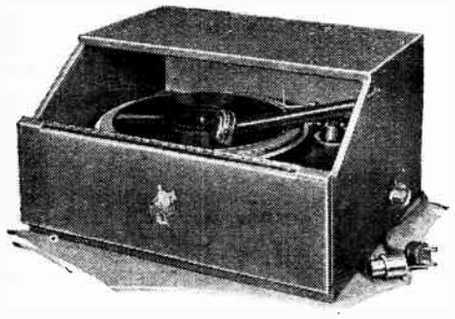
Some Suggestions for Adding Record Playing to the Radio Receiver

MANY requests are received as to how best to convert a modern radio set to a radio-gramophone. The purpose of this article is to direct attention to the variety of suitable units for this purpose available to those who do not wish to construct their own.

H.M.V. Model No. 116 Playing Desk.

THERE is a growing tendency on the part of the public to prefer to listen both to broadcasting and to records at a considerable distance from the loud speaker. In the case of broadcasts, if a complete programme is being listened to it is a simple matter to tune in the set at one end of the room and then settle down in comfort at the other end to enjoy the entertainment undisturbed. When, however, we want to play gramophone records, unless we have the luxury of a record changer we have to jump up and change the record each time.

It is for this reason, probably, more than any other that the type of unit known as a playing desk is growing in popularity.



Junior Model Apollo Playing Desk.

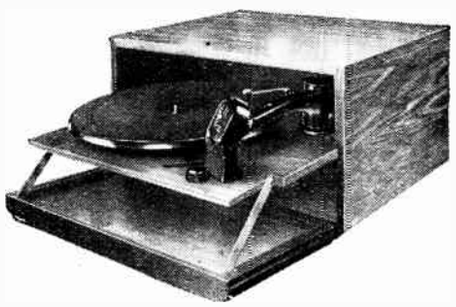
Whilst the very practical reader would probably construct or assemble such a unit for himself, there are many who have not the inclination or facilities for doing so.

Fortunately, there is quite a choice of units ready-made which serve to convert the radio set into a radio-gramophone complete. That every wireless receiver is a potential radio-gramophone is evident by the now almost universal practice of fitting two terminals or sockets, marked "Gramophone Pick-up." These units are available in several different styles, and at prices to meet all pockets. They range from portable units to large cabinets in which is embodied the gramophone equipment, and only the addition of a receiver chassis is needed to give a fully-fledged radio-gramophone. Here, however, we trespass on the constructors' field, since a certain amount of dismantling and reassembling is involved.

Fireside Models

The All-Electric Record Playing Unit of Bowyer-Lowe and A.E.D., Ltd., is a typical example of the portable pattern. In many respects it resembles a portable gramophone, but it is equipped with an electric motor, complete with automatic stop, pick-up, needle holders, and a graded volume control, and the price is £6 19s. 6d. Identical so far as its essential features are concerned, but differing constructionally, is the H.M.V. Model 116 Playing Desk. This is very compact, and measures about 10in. high, and with just enough space to accommodate a 12in. record, and it sits conveniently on a chair or low table by the fireside. The fittings comprise an H.M.V. electric motor with automatic brake and switch, pick-up, volume control, and needle holders. Housed in an attractive oak case having a felt-lined lid, the price is seven guineas for either an A.C. or a D.C. model.

By so designing the gramophone unit that it serves as a stand, or plinth, for the radio set, brings us one stage nearer to a self-contained radio-gramophone, and examples of this style are to be found in Apollo Playing Desks, the C.A.C. Converta-gram Playing Desk, the Harlie Fix-A-Gram, and the Univolt Electradio-Gram Unit in its cabinet forms. As several models in each make are available we might as well examine them in more detail, as doubtlessly many interesting features will come to light in the process.



Harlie Fix-A-Gram Gramophone Unit.

Now, taking these in the order mentioned: Apollo Playing Desks are made in six different styles, of which four are table type and two bureau models. Models No. 1 and No. 2 are table walnut cabinets with a sliding front panel and space on top to stand the receiver. The first-mentioned includes an electric motor with automatic brake and switch, Apollo "Goldring" pick-up, volume control, and needle receptacles, and its price is £5 17s. Its companion is for battery users and includes a spring motor, the other fittings being the same as in the mains version. With a single spring motor the price is £4 4s., and with a double spring one £4 12s. 6d.

A cheaper style, known as the Junior model, is now available for £4 17s. 6d. for mains supplies, or at £2 18s. 6d. with a spring motor. This is housed in a slightly smaller case, covered in brown leather cloth, with a hinged front. The equipment is as complete as the walnut cased models, and a Marconi Junior pick-up is fitted. All will accommodate 12in. records when fully closed.

Finally, there is the Bureau model, a handsome piece of furniture, measuring 30¼in. × 19in. × 17¼in., with an 18in. × 11½in. top for the set. These are made in walnut and oak, and range in price from eight guineas to £16 5s., the more expensive types being fitted with a Garrard automatic record changer. The lower cupboard affords storage space for eighty records, and A.C. and D.C. models are available.

The City Accumulator Co., Ltd., Converta-gram Playing Desk is of the pedestal type, and made of figured walnut. The fittings in the standard model consist of a Collaro electric motor, automatic brake and stop, pick-up, and volume control. These are mounted on a shelf which automatically slides forward when the front is opened, thereby giving easy access to the turntable and the controls. It measures 30in. high, and the top is 18¼in. × 16in., but these dimensions are elastic, and can easily be altered to suit individual requirements; likewise, the equipment and the woodwork can be made to comply to any desired specification. Indeed, the policy of this firm is to build to specification

Univolt Electradio-Gram Unit.

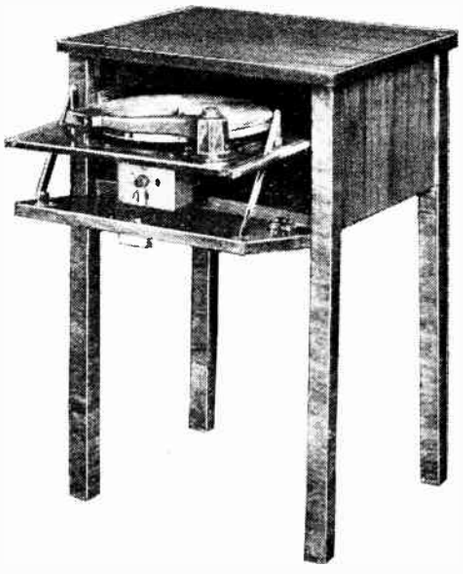
Radio-gramophone Conversion—

rather than to market a stock model. The standard product as described costs £6 19s. 6d. complete, while the cabinet alone can be purchased for £2 19s. 6d.

The Harlie Fix-A-Gram is a table model measuring 9in. high, the top, on which rests the receiver, being 16in. wide × 13in. deep. Its equipment comprises electric motor with automatic stop, pick-up, and volume control; these are assembled on a shelf which slides forward by the action of opening the front. Fitted with an A.C. motor it costs £5 15s. in a polished walnut cabinet. An exact duplicate, but with a double spring motor for battery set users, is available at £4 19s.

Conventional Cabinets

One of the outstanding features of the Univolt Electradio-Gram Unit is its remarkable compactness. Yet it is complete in every detail and embodies an electric motor with automatic stop, volume control and a mains master switch, the whole within the small compass of 14½in. × 10½in. × 2in. deep. And the price is £4 5s. Two cabinets of the pedestal type have been designed by the makers to house this unit and serve, also, as a stand for the wireless set. The unit is mounted on a pull-out shelf with a front resembling a drawer, and the whole forms a very attractive assemblage. The Pedestal Radio-Gram cabinet

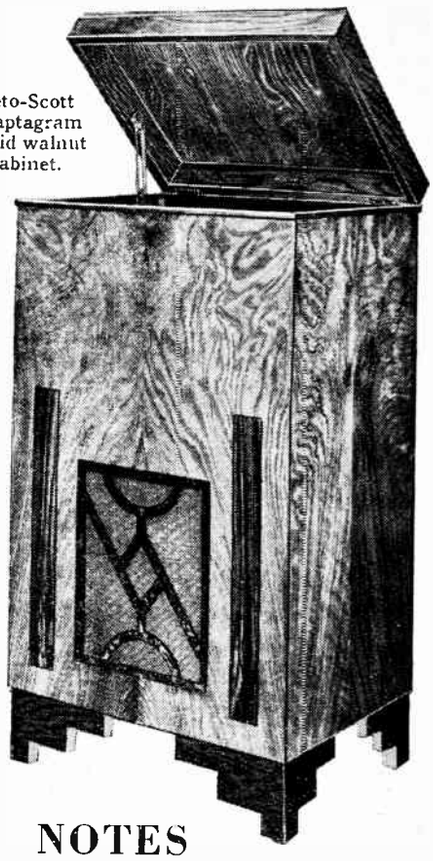


C.A.C. Converta-gram Playing Desk.

costs £6 15s., the other model is priced at £7 17s. 6d., and includes a spacious record cupboard.

In the foregoing the receiver and gramophone unit have retained their respective characteristics while yet offering all the facilities of a radio-gramophone. Indeed, it is only our accepted conception of this dual-purpose instrument, assuming, as it does, a cabinet of particular form, that precludes styling the composite apparatus a radio-gramophone, although in actual fact it has now attained this status. Only the mantle is necessary to complete the metamorphosis, but sundry constructional alterations will be involved. Nevertheless, some may be prepared to consider this change, in which case the Adaptagram cabinet made by the Peto-Scott Co., Ltd., will greatly facilitate the work. For this cabinet is available with the gramophone equipment ready assembled, and only the addition of the receiver chassis is needed to complete it. Fitted with a double-spring motor, pick-up, volume control and all other accessories, it costs six guineas in walnut, while for one guinea more it can be supplied fitted with an A.C. motor. Still a further model is available, and this embodies a Class "B" amplifier in addition to full gramophone equipment and a permanent magnet moving-coil loud speaker, and the price is £9 5s. The cabinet alone can be obtained for three guineas.

This résumé would not be complete without a reference to radio-gramophone cabinets since every modern receiver constructed in chassis form is readily convertible into a radio-gram. It must suffice, however, to say that cabinets of this type can be obtained from the Carrington Manufacturing Co., Ltd., C. A. Osborn, City Accumulator Co., Ltd., Dallow Manufacturing Co., Ltd., W. and T. Lock, Ltd., and F. Digby.



Peto-Scott Adaptagram inlaid walnut cabinet.

DISTANT RECEPTION NOTES

New German 100kW Station

IT was reported recently that an aeroplane had flown into Berlin Witzleben's aerial wires. The pilot fortunately escaped uninjured, but the same cannot be said of the 'plane or the aerial. Perhaps that is why nothing has been heard of the Berlin station for some little time now. Since every effort is being concentrated on getting the new station at Tegel completed, there is probably no time to spare for making a proper repair of the old aerial.

The new 100-kilowatt station at Tegel will probably be transmitting by the time that this note appears in print. It will work on 360.6 metres, thus becoming London Regional's next door neighbour in place of Mühlacker.

Stuttgart, still using the old 1.5-kilowatt plant, will then move to 533 metres, and Munich, also on low power for the time being, will transmit on 419.5 metres.

The object of this reshuffle is to enable the three stations to work as close as possible to the wavelengths that they will have after January 15th. When the Lucerne Plan comes into force Berlin goes to 356.7 metres, Munich to 405.4 metres, and Mühlacker to 522.6 metres.

As soon as Berlin is working at full power the business of separating this station from the London Regional may be rather easier with a highly selective set than was that of obtaining Mühlacker clear of interference. The reason is that owing to the increased power of the Berlin station it should lead to rather greater field strength in this country, though Berlin is about one hundred miles farther from London than Stuttgart.

Short-wave reception is better worth while at present than it has been for a long time. One aspect of this kind of very long-distance listening that will appeal to many enthusiasts is that there is no need to sit up beyond one's normal bedtime in order to make a good bag of stations. From dusk to about 9 p.m. stations with wavelengths below 20 metres have been wonderfully good of late. W2XAD on 19.56 metres and W8XK on 19.72 metres are outstanding early-evening signals. W8XK also conducts an afternoon transmission on 13.93 metres. This has not been receivable for a long time until lately, but now it is coming in again. VK2ME, the 31.55-metre Melbourne station, has also been well received in the afternoons on several recent occasions.

Of the European long-wave stations Huizen is now completely ruined by interference on, or almost on, the same wavelength, and Luxembourg is again heterodyned. Kalundborg, however, is free of interference from Monte Ceneri, and with a selective receiving set both stations are receivable. Radio-Paris, Zeesen, Warsaw, Motala and Oslo can all be relied upon for good reception. Both Vienna and Budapest are coming in wonderfully well. We should obtain magnificent reception from them when Vienna's second mast is completed and Budapest's new transmitter comes into action.

I don't know whether other readers have tuned over the medium waveband lately between four and five o'clock in the afternoon. If they have not, they may obtain a surprise when they do so. On the afternoon when these notes were written a four-valve receiver brought in Brussels No. 2, Langenberg, Beromünster, Stockholm, Leipzig, Strasbourg, Breslau, Göteborg, Hilversum, Heilsberg, Turin, Hörby and Nürnberg, all at good loud speaker strength.

In addition to the stations mentioned, Rome, Prague, Hamburg, Milan and Trieste provide good and reliable reception.

"D. EXER."

NEWS of the WEEK

Current Events in Brief Review

Radio-Paris

RADIO-PARIS is now officially a State station. Programmes are arranged by members of the original management in collaboration with the Post Office.

The English Flavour

LISTEN to the announcements by the "speakerine" of the Radio-Côte d'Azur station. Listeners state that her French is spoken with an English accent, due to the fact that the speaker, Mlle. Leo Baillet, was brought up in England.

Believe It or Not

THE cigar-box receiver, which has been a sensation for so many years, has received the *coup-de-grâce* in Marseilles with the invention of the "cigar set" or super-midget, which, when lit up, receives all European stations. According to the report—and who dare doubt it?—the hyper-Lilliputian speaker forms the cover of a tiny goblet containing a cocktail.

Marconi and the Amateur

MARCHESE MARCONI has caused delight among the American amateur fraternity by a happy incident which occurred just after his recent visit to the Chicago World's Fair. At 11 p.m., when the Marchese's party were preparing to return to their hotel, the inventor suddenly said: "I hear that there is an amateur station in the Fair. I want to go and see it." There and then the Marchese proceeded in his big Cadillac to the building where the American Radio Relay League operated an amateur station.

The two operators on duty failed to recognise their distinguished visitor, but he at once introduced himself. After inspecting the equipment carefully he remarked that it was a very fine piece of workmanship. The proud builder deprecated his efforts, saying: "But it was built by only an amateur."

"Ah," said the Marchese, "I am only an amateur myself."

Hughes Medallist

PROFESSOR E. V. APPLETON has been awarded the Hughes Medal by the Royal Society for his researches into the effect of the Heaviside Layer upon the transmission of wireless signals.

Professor Appleton's researches at King's College, London, led to the discovery of a second "Heaviside Layer," often known as the Appleton Layer, above the one already known. He is forty-one, and became an F.R.S. at the age of thirty-five.

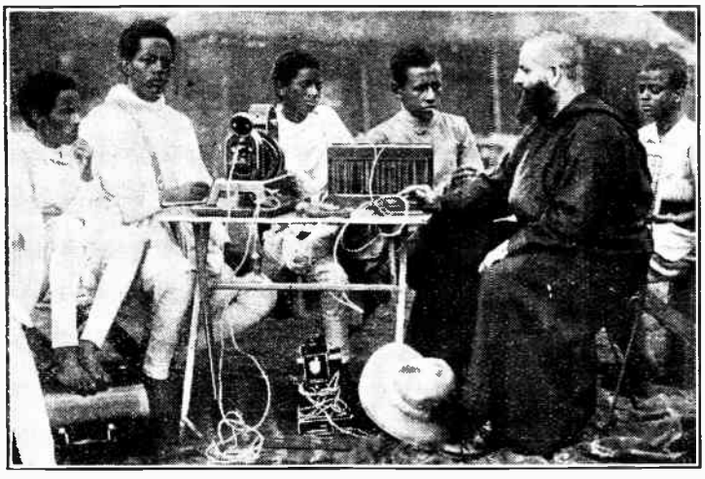
Lady Amateur Loses Licence

TO Mrs. Doris Melanson, of Station WIFSM, Belmont, Mass., belongs the melancholy distinction of being the first American lady radio amateur to lose her licence. The licence has been revoked by the Federal Radio Commission on the grounds that the lady's husband is a citizen of Canada, and the radio law specifically forbids the operation of a transmitter on the property of an alien. Unhappily, too, it is said that Mr. Melanson pleaded guilty to a conspiracy to violate the liquor laws.

The dice seems to have been heavily loaded against Mrs. Melanson.

Tourists' Radio in Italy

TOURISTS may now take portable wireless sets into Italy free of duty for a period of three months. A special wireless licence is available for this period at a fee of lire 15 (about five shillings), which is issued by the Italian Broadcasting Company.



DOTS AND DASHES IN ETHIOPIA. Father Esuyen, a French Capuchin monk, who has opened a school in Abyssinia for budding wireless operators, who are prepared for the Government examinations.

In the West Country

THE listening habit is growing in the West Country, where licence numbers show a steady increase. At the end of September there were 103,932 licences in existence in Devon; Cornwall returned 29,798 licences, Somerset 54,634, and Dorset 21,286. The total monthly increase in the four counties was nearly 2,500.

Pirates' Paradise

YUGO-SLAVIA is a great stronghold of radio pirates, and, according to the Belgrade Radio Company, they are equal in numerical strength to the licensed listeners. The licence fee is 300 dinards per annum or 25 dinards (about two shillings) a month. Up till now, no action has been taken to enforce payment of licence fees.

Many listeners refuse to pay on account of the interference caused by the Italian military Alpine transmitters on the Italian-Yugo-Slavian border. Interference is most marked on the transmissions of Ljubljana, the station of the famous "cuckoo call."

A World Beater

THE letters "WBE" after the name of an amateur indicate that he holds the Radio Society of Great Britain's certificate for telephony, the condition being that he shall have communicated *by telephony* with a station situated in a British possession in each continent of the world. This distinction has been won by Mr. Frank R. Neill (G15NJ), of Whitehead, Belfast, who is understood to be the second amateur to have secured this honour. He also holds the WAC (worked all Continents) certificate for telephony, and both the WBE and WAC certificates for C.W. He is believed to be the only person in the world holding all four certificates.

State-aided Trade

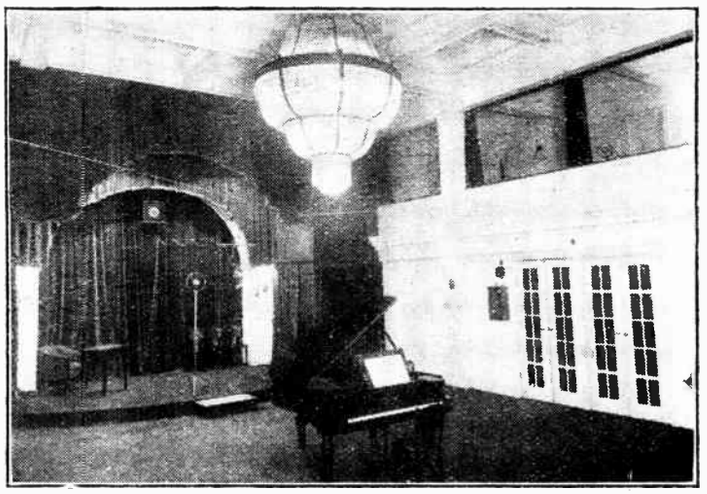
THE Belgian "Minister of Public Instruction" has ordered all teachers to procure wireless sets and listen regularly to the programmes. Commenting on this fiat, a French contemporary wishes that the Ministers of Transport and Marine would follow suit, as this would boost up the sales of motor cars and motor boats.

Zagreb Power Increase

A NEW 20-kW. station is being built at Zagreb, Yugo-Slavia, to replace the existing 0.75-kW. transmitter.

R.N.W.A.R. Dinner

SIXTY-FOUR members from all parts of the country were present at the First Annual Dinner of the Royal Naval Wireless Auxiliary Reserve held at Pinoli's Restaurant, Wardour Street, on October 28th. Chief Officer Glastonbury, R.N., replying to the toast of "The Visitors," drew attention to the rapidly growing efficiency of "Britain's Youngest Reserve."



SCHUBERT CELEBRATIONS AT WARSAW. The main studio at Polskie Radio. From here on Sunday next, at 11.5 a.m., the Philharmonic Orchestra will broadcast a concert commemorating the 105th anniversary of Schubert's death.

128 Kilowatts from Bergen

A NEW broadcast transmitter is to be erected at Bergen with a power of 128 kW. in the aerial. The station is to be built by the Marconi Company.

Grave and Gay

THE unhappy incongruities which sometimes attach to radio advertising were again illustrated by one of the private broadcasting stations in Paris the other day. A news item describing how a man in a state of drunkenness had murdered his wife was immediately followed by an advertisement opening with the boisterous slogan, "Drink wine and live happy!"

The Cautious President

PRESIDENT ROOSEVELT'S broadcasts, it has been decided, must be limited in number if his more momentous pronouncements over the microphone are to be given their proper valuation.

It is suspected that both President Hoover and the late President Coolidge were too generous in according facilities to the broadcasting networks, with the consequence that presidential speeches ceased to be "star" items. In seven years President Coolidge broadcast thirty-seven times, while President Hoover, during his four years in office, was heard no fewer than ninety-eight times.

Page 393 follows after the Programme Supplement.

The Wireless World

FOREIGN PROGRAMME SUPPLEMENT

SUNDAY

NOVEMBER THE NINETEENTH

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.0 to 4.0 p.m.,** Programme by the I.B.C. (Ireland), Ltd. **1.0,** Light Music. Stay out of my Dreams (Petkere). Moonstruck (Coslow); Argentina Moon (Elkins); Good Friends (Heymann); Gypsy Fiddles; Trouble in Paradise (Wever); I give my Heart (Millöcker); There's something about a Soldier (Gay). **1.30,** Concert. The Grass is getting greener (Newman); Sweet Dreams, pretty Lady (Downey); This time it's Love (Lewis); Learn to Croon (Coslow). **1.45,** Dance Music. The River's takin' care of me (Greer); Adorable (Whiting); Butterflies in the Rain (Myers); Puss, Puss, Puss (Hargreaves). **2.0,** Concert of Light Music. Selection from Waltzes from Vienna (Joh. Strauss), Home on the Range; Smilin' through (Penn); My Moonlight Madonna (Webster-Fibich). **2.15,** Orchestral Concert. Pizzicato from Sylvia (Delibes); Barcarolle from The Tales of Hoffmann (Offenbach); Violin Solo: Serenade to Nicolette (Russell); Invitation to the Waltz (Weber). **2.30,** Popular Concert. Victory March (von Blon); Song, Under Heaven's Blue (Pola); My Moonlight Madonna (Webster-Fibich); Pianoforte Solo: The Skater's Waltz (Waldteufel-Stecle); The Glow-Worm Idyll (Lincke); Violin Solo: Hungarian Dance in G minor (Brahms); The Last Round Up (Hill); Black Eyes (Ferraris). **3.0,** Variety Concert by Tony Reddin and his Radiolians. Signature Tune: Sweep; Peter, Peter (Connelly); What have we got to lose?; I found the Right Girl (Lupino); Back in the Old Sunday School; Morning, Noon and Night; The Day you came along; Selection from Rose-Marie (Friml); I wake up smiling (Ahlert); Irish Medley; I could make a Good Living at that; Parlez-moi d'amour (Lenoir); Down in the Valley (Hanley); Thank Heaven for you; Selection from The Desert Song (Romberg); Reflections in the Water (Loeb); Yodel, Mountain Refrain; Closing Signature Tune: Let's call it a Day. **8.30,** Time Signal. **8.31,** Concert by the Station Orchestra. Soloists: Ernest Hargreaves (Tenor) and James O'Neill (Baritone). **9.30,** Adventures of Ellis Palmer. **10.15,** The Station Orchestra. **10.25,** Gaelic Songs by P. MacGreine. **10.40,** Pipe and Fiddle Recital by S. O'Laoghaire and P. Clancy. **11.0,** Time Signal, News, Weather Report and Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**11.0 a.m.,** Chimes from the Cathedral and Weather. **12 Noon,** Gramophone Concert. In the interval at **1.30 p.m.,** Theatre Review. **2.0,** Sextet Concert. **3.0,** Programme for Hospitals and Other Benevolent Institutions, with Gramophone Records. **4.0,** Interval. **5.30,** Agricultural Talk, followed by Gramophone Records. **6.0,** Music by the Station Orchestra. **6.30,** Songs from Operettas. **7.0,** Concert by the Station Orchestra. **8.0,** Dance Music by the Demons' Jazz Band, relayed from the Hollywood Bar. **9.0,** Gramophone Records. **10.45,** Chess Lesson. **11.0** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**9.0 a.m.,** See **Rome. 9.30,** Agricultural Talk. **9.45,** Bible Reading. **10.0 to 11.0,** See **Turin. 11.30,** See **Rome. 11.45 to 1.15 p.m.,** See **Turin. 3.0,** till Close Down. See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**10.30,** See **Leipzig. 11.0,** Military Band Concert. **11.55,** Time Signal. **12 Noon,** Concert from **Breslau. 1.0 p.m.,** Talk: The Hitler Jugend and their part in Winter Relief Work, followed by Radio Report from a Hitler Jugend Centre. **1.30,** Programme for Children. **2.0,** Concert of European Dances, conducted by Eugen Sonntag. **3.0,** Alfred Hein reads from his own Works. **3.25,** Report of the Second Half of the International Football Match, Germany v. Switzerland. **4.10,** Part Relay of the Evangelical Church Festival for the Four Hundred and Fiftieth Birthday of Martin Luther. **5.0,** Famous Arias—Song Recital by Miliza Korjus (Coloratura-Soprano). **5.30,** Gramophone Records of Light Music. **5.50,** Sports Notes. **6.0,** Worms—A Crisis in the History of the Reformation—A Luther Play (Josef Buchhorn). **7.30,** Choral Concert, relayed from St. Mary's Church. Conductor and Soloist: Hans Georg Görner (Organ). **8.30,** Fantasia in C (Schumann) played by

LUTHERAN FESTIVAL. A contemporary portrait of Martin Luther, the 450th anniversary of whose birth is being celebrated to-day in the programmes of Berlin (Deutschlandsender) and Leipzig.

Lamond. **9.0,** News. **9.30,** A Dialogue. **9.45,** Weather. **10.0,** Radio Report of the Six Days' Racing from the Sport Palast, Berlin, followed by Serenade from **Munich. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—10.30 a.m.,** See **Leipzig. 11.0 a.m.,** See **Heilsberg. 1.0 to 1.30 p.m.,** Interval. **1.30,** Pictures from the Lives of the Great Musicians of the Reformation. **2.15,** Berlin Curiosities. **2.30,** Sports Notes. **3.0,** See **Leipzig. 4.30,** Reading: The Young Luther (Will Vesper). **5.0,** The Never-ending Reformation—A Radio Sequence from Documents of Five Centuries (arr. Kurt Ihlenfeld. **5.50,** Sports Notes. **6.0,** See **Berlin (Deutschlandsender. 7.30,** See **Leipzig. 9.0,** News. **9.15** (approx.), Programme of Light Music on Gramophone Records. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—**6.0 p.m.,** See **Prague. 6.20,** See **Brno. 7.10,** See **Prague. 10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—10.30 a.m.,** Concert by the Silesian Philharmonic Orchestra, conducted by Topitz. In an interval from **11.30 to 12 Noon,** Talk on Selma Lagerlöf, on the Seventy-fifth Birthday of the Authoress. **1.0 p.m.,** News. **1.10,** Talk: Wireless Weather Forecasts. **1.35,** Gramophone Records of Wind Instrument Music. **2.10,** Talk: The Scandinavian Woman and Marriage. **2.30,** Programme for Children. **3.0,** Concert of Light Music from the Café Vaterland. **4.45,** A Report on the International Football Match, Germany v. Switzerland, at Zurich, followed by Sports Notes. **5.45,** Programme Announcements. **6.0,** See **Berlin (Deutschlandsender). 7.30,** See **Leipzig. 8.15,** News. **8.30,** See **Berlin (Deutschlandsender). 9.0,** Time and News. **9.30,** Serenade on Gramophone Records. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**2.0 p.m.,** Report on the Czechoslovak Aviation Day, relayed from Olomouc. **3.0,** Concert by the Station Orchestra, conducted by Bakala. **4.30,** Trio, Op. 29 (Rejacevic), by the Brandl Trio. **5.0,** German Transmission: Song Recital by Rita d'Origa (Mezzo-Soprano) and Otto Koch-Gaarden (Baritone). **6.0,** See **Prague. 6.20,** Concert by the Station Orchestra, conducted by Janota. **7.10,** Recital of Yugoslav Songs **7.30** till Close Down, See **Prague. 10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**10.0 a.m.,** Concert by the Small Station Orchestra conducted by Leemans. **11.0,** Selection from The Damnation of Faust (Berlioz), on Gramophone Records. **12 Noon,** Concert by the Radio Orchestra, conducted by Franz André. Soloist: Mlle. Devischer (Songs). **1.0 p.m.,** Le Journal Parlé. **1.10,** Orchestral Concert, conducted by André Felleman, relayed from the Grand Hotel, Antwerp. **5.0,** Concert by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp. **5.30** (approx.), Football Results. **6.0,** Gramophone Concert of Light Music. **6.15,** Fauré Song Recital by Frédéric Anspach. **6.45,** Le nouveau locataire—Sketch (Léon Donnay). **7.0,** Gramophone Music. **7.15,** Religious Address. **7.30,** Le Journal Parlé. **8.0,** Les cloches de Corneville—Operetta (Planquette), relayed from the Grand Theatre Verviers. In the intervals, Sketches and Monologues (on Gramophone Records) and Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**10.0 a.m.,** Gramophone Records. **11.0,** Concert by the Small Station Orchestra, conducted by Leemans. **12 Noon,** Concert relayed from the Grand Hotel, Antwerp: Soloist: Carlo Frank (Songs). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Radio Orchestra, conducted by Franz André: Soloist: Mlle. Devischer (Songs). **5.0,** Dance Music relayed from the St. Sauveur Palais de Danse. In the interval at **5.30** (approx.), Sports Results. **6.15,** Trio No. 3 (Mozart) on Gramophone Records. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans. **7.15,** Religious Address. **7.30,** Le Journal Parlé. **7.55,** Music Review. **8.0,** Concert by the Radio Orchestra, conducted by Franz André: Soloists: Steurs (Accordion), Durand and Laboureur (Cornets), Dandois (Piccolo), Brenders (Pianoforte) and Misson (Violin). In the interval at **8.45,** Recitations. **10.0,** Le Journal Parlé. **10.10,** Concert relayed from the Ancienne Belgique.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **7.30 p.m.** till Close Down. —**8.15 a.m.,** News. **9.0,** Protestant Service. **10.0,** Catholic Service. **11.25,** Orchestral Concert, conducted by Ferdinand Zsolt. In the interval, Radio Chronicle. **1.0 p.m.,** Gramophone Concert. **2.0,** Agricultural Talk. **2.45,** Military Band Concert. **3.30,** Reading. **4.30,** Humorous Readings (Franz Herczeg). **5.0,** Quintet Concert. **5.45,** Talk with Gramophone Records. **6.30,** Concert by the Alexander Bura Cigány Band. Soloist: Ludwig Radics. **7.15,** Sports Notes. **7.30,** Koloman Chovan Concert by the Orchestra of the Academy of Music, conducted by Ferdinand Zsolt. Soloist: Stefan Laub (Pianoforte). **9.15,** Music by the Lajos Veres Cigány Band and the Georg Gutenberg Dance Band, relayed from the Café Ostende. Soloist: Paul Kalmar.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY. 12 Noon,** Talk in English: Current Economic Problems. **12.20 p.m.,** Talk in German: The Friedrichshafen Aerodrome. **12.40,** Talk in French. **1.0,** Accordion Trio Concert. **1.25,** Gramophone Records. **1.55,** Programme for Children. **2.25,** Concert of Folk Music, relayed from the State Broadcasting Building. The Station Symphony Orchestra, conducted by Launy Gröndahl, and a Palestrina Choir conducted by Mogens Wöldike. **4.0,** Divine Service relayed from **Holmens-Kirke. 5.20,** Talk. **5.50,** Weather and Announcements. **6.0,** News and Sports Results. **6.15,** Time. **6.30,** Talk: Selma Lagerlöf's Seventy-fifth Birthday. **7.0,** Chimes from the Town Hall. **7.5,** The Hansen Family—Sketch (Locher). **7.15,** Serenade in F (Klengel), by the Station String Orchestra, conducted by Emil Reesen. **7.40,** Danes in Sunny Italy—Song Recital by Hallander Hellemann, with Introductory Talk. **8.20,** Saxophone Solos by Sigord Rascher. **8.40,** Song Recital by Kirsten Krag Jespersen. **9.0,** News. **9.15,** Concert of Ballet Music. The Station Orchestra, conducted by Emil Reesen. **10.0,** Dance Music, relayed from the Ritz. In the interval at **11.0,** Time and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**8.45 a.m. to 12 Noon,** Programme in English by the I.B.C. **8.45,** Military Music. March, The Standard of St. George (Alford); Loin du bal (Gillet); A Life on the Ocean (Binding); Xylophone Solo: National Emblem March (Bagley); The Whistler and his Dog (Pryor); Squirrel Dance (Elliott-Smith); The Turkish Patrol (Michaels); The Wed-

ding of the Rose (Jessel); Policeman's Holiday (Ewing); Hobomoko (Reeves); The Teddy Bear's Picnic (Bratton); L'entente cordiale (Allier). **9.30,** Orchestral Concert. Southern Rhapsody (Hosmer); Play of Butterflies (Heykens); The Busy Bee (Bendix); Pianoforte Duet: Who do you think you are? (Heymann); Love and Life in Vienna (Renard); My Lady Dainty (Hesse); Veleta Medley (Varney); One alone (Romberg). **10.0,** Dance Music. I wake up smiling; Down the old Ox Road; Piccaninny; Hobo, you can't ride this train; Come out, Vienna; Sweep; Aloha Oe; In a second-hand store; Way out Kansas; Where are you to-night?; P.C.123; Falling Star; Rockin' Chair; Little Miss Muffet; A one horse Town; I can't remember. **11.0,** Happy Hour. Part I. Light Music. Signature Tune; Accordion Band: Milano (Le Clerq); Lazy Pete (Werner); The Coon among the Chickens (Ives); Amina (Lincke); Dainty Lady (Peter); Put that Sun back in the Sky; Hummin' to myself; Running away from everybody; If it ain't Love; Gone to town. Part II. Organ Recital. The Swirl of the Kilt (Ewing); A Cuckoo in the Nest; (Sievier); The Penguin's Patrol (Reaves); Valse poudrée (Popy); The Organ Grinder (Stept); Hallelujah Chorus (Handel); Signature Tune. **12 Noon,** Programme in French. **2.0 to 7.30 p.m.,** Programme in English by the I.B.C. **2.0,** Concert. Song: There's a Good Time coming; Orchestral Selection; Song: Put on your old grey bonnet; Song: The Seat Song; Orchestral Selection; Chorus: I'm falling in love; Orchestral Selection; Song from That's a good girl; Orchestra: The Chicken Reel; Moonlight and Roses; Song: Smile for me; Orchestra: Selection from Love me to-night; Song: Pu-leeze, Mr. Hemingway; Orchestra: Selection from Queen High. **2.30,** Light Music. The Glow-Worm's Wedding (Siede); Monsieur Tricotin (Rawlingson); Everybody loves my baby (Palmer); Toujours, toujours (Manilla); Falling my way (Lang-Kress); Moonbeam (Peter); Doggone, I've done it (Franklin); Little Romany (Leon). **3.0,** Special Birthday Request Programme. The Doge's March (Rosse); Love's old sweet song (Molloy); The Bells of St. Mary's; Somewhere a voice is calling (Tate); Parade of the Tin Soldiers (Jessel); On the edge of the lake (Coates). Valse bluette (Drigo); Bells of Somerset. **3.30,** Syncopated Pianoforte Playing, and how to do it—Billy Mayerl playing. Marigold (Mayerl); It's the talk of the Town (Levinson); Balloons (arr. Mayerl). **4.0,** Tango Band. Nina; Rosa Mia; Aromas Mendocinas; Elvira. **4.15,** The Nursery Corner with Columbus and Belinda. **5.0,** Accordion Band. Cocktails (Cuvelier); At the Bal Musette (Alexander); By the shimmering Twilight Sea (Williams); Emilienne (Alexander); Marietta (Charlier); The Valse of the Gigolo (Alexander); Aux printemps (Alexander); C'est l'amour (Pierre). **5.30,** Gramophone Records. The Shadow Waltz (Dubin); Caprice viennois (Kreisler); Widdecombe Fair (arr. Jacob); My Girl ran away (Steinberg). **5.45,** Concert. How could We be Wrong?; Adios, Good-bye; Experiment; My Moonlight Madonna. **6.0,** Concert. Washington Post March (Sousa); Song, Wid de Moon, Moon, Moon (Cook); It's the Talk of the Town (Symes); Marching through Georgia (Work); I'm the landlord of the Inn in Aberfoyle (Roberts and Fyffe); The Clatter of the Clogs (Fynn); Experiment (Porter); The Teddy Bears' Picnic. **6.30,** Dance Music. Isn't it Heavenly?; Don't blame Me; From me to You; Sweetheart Darlin'; Trouble in Paradise; I've told every little Star; A couple of fools in Love; Stay out of my Dreams. **7.0,** Members' Request Hour. Blaze away (Holzmann); Rhapsody in Blue (Gershwin); Sanctuary of the Heart (Ketelbey); Kathleen Mavoureen; Cupid's Army (Sievier); Ah, sweet Mystery of Life; Roses of Picardy; Waltz from Bitter Sweet (Coward). **7.30,** Programme in French. **9.0** till Close Down: Programme in English by the I.B.C. **9.0,** Dance Music. Signature Tune: Happy Feet; Ninon; Vilja; Everyone loves my Marguerite; How could we be Wrong?; Conchita; Shadows on the Swanee; Little Romany; The last Round Up; Signature Tune: Happy Feet. **9.30,** Talkie Time. Tunes from the Talkies and Shows. Signature Tune: Sittin' in the Dark: Selection from College Humour; Happy Ending; Selection from Music in the Air; Butterfly Song; Why has a Cow got four Legs?; Let the world go drifting by; There's something about a Soldier; I've got to pass your house to get to my house; Signature Tune. **10.0,** Concert. Humoresque (Dvorak); Sans Souci (Blon); Song, Little Grey Home in the West (Lohr); Whispering Flowers (Blon); Romance (Rubinstein); Kashmiri Song (Woodforde-Finden); Song, Violets (Wright); The Golliwog's Cake Walk (Debussy). **10.30,** Concert of Popular Music: Thanks; Experiment; Smoke Rings; Heart of Stone; Black Moonlight; Night and Day; I've got you on my mind; Selection from Give me a Ring. **11.0,** Concert. Signature Tune: Happy days are here again; The Gold-diggers' Song; Oh Johanna; If I had someone to Love; Why this Night?; Whistling under the Moon; I'm getting sentimental over you. Throw open wide your window; 'Bout this time next week; Signature Tune: Happy days are here again. **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd. Signature Tune: Come Back to Erin; Minuet from the Petite Suite (Debussy); Entrance of the Little

NOV. 19th SUNDAY *continued*

Fauns (Pierné); Salut d'amour (Elgar); Farewell my native Irish Home (Traditional); Selection from Les Millions d'Arlequin (Drigo); Softly awakes my Heart (Saint-Saëns); Ballet égyptien (Luigini); One fine day from Madame Butterfly (Puccini); Signature Tune: Come Back to Erin. **12.5 a.m. (Monday),** Late News Bulletiu in English. **12.10,** Club Concert for Straford-on-Avon Listeners. Signature Tune: The Chuni Song. Goofus; If You'll say Yes, Chérie; Dancing Butterfly; Nunca; Selection from Dinner at Eight; Tick-Tock; A couple of Pals; The Wedding of Mr. Mickey Mouse; Symphony of the Breeze; Twixt the Devil and the Deep Blue Sea; I bring a Love Song; Lazybones; Let's call it a Day; Signature Tune. **1.0** Organ Recital. Overture, Poet and Peasant (Suppé); Minuet antique (Watling): Prière à Notre Dame (Boelli); Waltz, Suite No. 3 (Coleridge); Chant sans paroles (Tchaikovsky); Berceuse de Jocelyn (Godard); Toccata from the Suite Gothique (Boelli). **1.30,** Gramophone Concert. Washboard Blues; Sweet Sue; Everybody loves my Baby; Many Happy Returns; There's a cabin in the Pines; Selection from The Chocolate Soldier (O. Straus); I've got the World on a String (Arlen); Selection from The Kid from Spain (Kalmar). **2.0,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—10.30 a.m.,** See **Leipzig. 11.0,** See **Langenberg. 12 Noon,** See **Stuttgart. 12.15 p.m.,** Concert on Gramophone Records. **1.25,** Talks arranged by the Wiesbaden Board of Agriculture. **1.35,** Rural Programme—a Radio Report. **2.0 to 5.0,** See **Stuttgart. 6.0,** See **Berlin (Deutschlandsender). 7.30,** Concert. Part I: Choral Prelude, Ein' feste Burg ist unser Gott (Reger). Part II: Brahms Music: Folk Songs and Pianoforte Solos. Part III, Septet, Op. 20, for Violin, Viola, 'Cello, Double-Bass, Clarinet, Bassoon, and Horn (Beethoven). **9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News, Weather, and Sports Notes. **9.45** till Close Down, See **Langenberg. 1.0 a.m. (Monday),** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—11.0 a.m.** (from **Hanover**), Concert in Honour of the Twenty-Fifth Anniversary of the Hanover Male Voice Choir, relayed from the Aula des Ratsgymnasiums at the Rustplatz. **11.55,** Time Signal. **12 Noon,** Concert by the Small Station Orchestra, conducted by Fritz Gartz. **1.0 p.m.,** Programme for the Hitler Jugend. **1.50** (from **Bremen**), Flute and Bassoon Recital. **2.20,** Radio Report of the Second Half of the Hamburg-Berlin Football Match. **3.15,** Concert by the Station Orchestra, conducted by Adolf Secker. **4.15,** Programme in North German Dialect. **4.45,** Radio Report: A Visit to the North German Theatres—The Municipal Theatre of Lübeck. **5.45,** Sports Notes. **5.50,** Weather. **6.0,** See **Berlin (Deutschlandsender). 7.30,** Concert of Chamber Music by the Schmalmack Quartet: String Quartet in D, Op. 20, No. 1 (Haydn); String Trio in B Flat (Schubert). **8.5** (from **Hanover**), Talk on the Hanover Legion, for the One Hundred and Thirtieth Anniversary of its Foundation. **9.0,** News. **9.30,** Programme from **Berlin (Funkstunde).** In the interval at **10.0,** Review of the Week.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—10.30 a.m.,** German Life in German Song—Dialogue on German Folk Songs. **11.0,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. **1.0 p.m.,** Talk on Chess. **1.30,** Talk for Young People: German Customs. **2.0,** Reading of Tales. **2.25,** Gramophone Concert of Popular Music. **3.25,** See **Berlin (Deutschlandsender). 4.10** (from **Danzig**), Talk: Characteristics of the Music of different German Composers. **4.35,** Talk on Luther. **5.0,** Telemann Concert, relayed from Königsberg Castle. The Station Orchestra, conducted by Erich Seidler, Mia Nensitzer-Thoennisen (Songs) and Margarethe Schuchmann (Harpsiehord). Introduetory Talk. **6.0,** See **Berlin (Deutschlandsender). 7.30,** Sports Notes. **7.35,** Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner. **9.0,** News. **9.15** (approx.), Programme from **Berlin (Funkstunde).** In the interval from **10.0 to 10.10,** See **Berlin (Deutschlandsender). 11.0** (approx.), Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.** and 20 kW. from **5.40 p.m.—8.40 to 11.40 a.m.,** Programme of the Workers' Radio Society (V.A.R.A.). **8.40,** Horticultural Talk. **9.10,** Orchestral Concert. In the interval at **10.0,** Recitation. **11.10,** Talk. **11.40 to 4.40 p.m.,** Programme of the General Broadcasting Society (A.V.R.O.). **11.40,** Time Signal. **11.41,** Concert by Kovacs Lajos and his Dance Band. In the intervals, Songs by the 's Hertogenbosch Male Voice Choir. **1.40,** Weekly Book Talk. **2.10,** Concert relayed from the Concertgebouw, Amsterdam. The Concertgebouw Orchestra, conducted by Pierre Monteux. Soloist: Ernest Schelling (Pianoforte); Melody; Pianoforte Concerto (Chopin); Suite, Printemps (Debussy); La Valse (Ravel). **3.40,** Radio Report by an Eye Witness of the Six Days' Racing at Amsterdam. **4.25,** Football Results and Gramophone Records. **4.40,** V.A.R.A. Programme for Children. **5.40 to 7.40,** Programme of the Liberal Protestant Radio Society (N.C.R.V.). **5.40,** Book Review. **6.10,** Divine Service. **7.40** till Close Down, A.V.R.O. Programme. **7.40,** Time and News. **7.55,** Concert by the Wireless Orchestra, conducted by Albert van Raalte. Soloist: Vasa Prihoda (Violin). **9.55,** Radio Report by an Eye Witness of the Six Days' Racing at Amsterdam. In the intervals, Gramophone Records. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW from **3.40 p.m.—8.10 to 9.10 a.m.,** Programme of the Catholic Radio Society (K.R.O.). Religious Programme. **9.10 to 11.55 a.m.,** Programme of the Christian Radio Society (N.C.R.V.). **9.10,** Sacred Music on Gramophone Records. **9.30,** Divine Service relayed from a Church at Leeuwarden. **11.15,** Sacred Music by a Choir. In the interval, Gramophone Records. **11.55 to 4.40 p.m.,** Programme of the K.R.O. **11.55,** Concert by the K.R.O. Boys. **12.40,** Talk: The Life of a Missionary. **1.0,** Concert (contd.), **1.50,** Talk. **2.10,** Gramophone Music. **2.40,** Programme of Talks and Music: Marche du Pape; Kaiserwalzer (Joh. Strauss); Medical Talk; Wedgwood Blue (Ketelbey); Talk by Paul de Waart; Talk: The Missions; Hymn. **3.40,** Concert by the K.R.O. Orchestra, conducted by van 't Woud. **4.10,** Programme for Hospitals. **4.40 to 7.25,** Programme of the N.C.R.V. **4.40,** Organ Recital. **5.40,** Divine Service, from the Hague, followed by Sacred Music on Gramophone Records. **7.25** till Close Down, Programme of the K.R.O. **7.25,** Football Results. **7.30,** Talk. **7.55,** Concert by the K.R.O. Orchestra, conducted by Gerritsen. Soloist: Elize de Haas (Soprano). In the interval at **8.25,** News. **9.5,** Gramophone Music. **9.15,** A Radio Play (Georg Rendl). **9.55,** News. **10.0,** Concert by the Station Orchestra, conducted by Gerritsen. **10.20,** Choral Epilogue. **10.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Sports Notes and Amusement Guide. **8.15,** Radio Concert. In an interval at **9.0,** News. **10.0,** Request Half-hour. **10.30** till **1.0 a.m. (Monday),** Programme in English by the I.B.C. **10.30,** Light Orchestral Concert: Spanish March. Augero (Franco); Wedding of the Rose (Jessel); Turkey in the Straw (Guion); Selection from The Maid of the Mountains (Fraser-Simson); Little Lady (Augustia); Song of Songs (Moya); The Grasshopper's Dance (Bucalossi). **11.0,** Vocal Concert: Selection from Noel Coward's Cavalcade; Kashmiri Song (Woodforde-Finden); Marianne (Ahlert); You are my Heart's Delight (Lehár); The Vicar of Bray (arr. Tait); Killarney (Balfe); The King's Horses (Graham). **11.30,** A Half-Hour with Strauss: The Blue Danube; Roses from the South; Tales from the Vienna Woods; Vienna Bon-Bons; Voices of Spring; St. Mary's Chimes; Wine, Woman and Song. **12 Midnight,** Dance Music: Waltzing in a Dream; Hold me; Maybe I love you too much; Love is the Sweetest Thing; Butterflies in the Rain; I can't remember; Let's all dance the Polka; Harlem Fuss; Put a little Springtime in the Winter of their Lives. How do you do, Mr. Brown? Drifting down the Shalimar; It's within your Power; Moon Song; In the Valley of the Moon; You're my everything; My Heart's To Let. **1.0 a.m. (Monday),** I.B.C. Goodnight Melody and Close Down.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**10.30 a.m.,** See **Leipzig. 11.0,** Concert by the Station Orchestra, conducted by Kühn. Soloists: Klärc Hansen (Soprano) and Heinz Schlebusch (Tenor). **12 Noon,** See **Stuttgart. 12.15 p.m.,** Concert of Folk Songs and Dances by the Station Orchestra and Choir and Soloists. **1.0,** Talk: The Dog Lover—with Illustrations. **1.30,** Agricultural Talk. **1.45,** Talk for Parents and Children. **2.0 to 5.15,** See **Stuttgart. 6.15,** Gramophone Report of the Second Half of the International Football Match, Germany v. Switzerland. **6.0,** See **Berlin (Deutschlandsender). 7.30 to 9.20,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News, Weather and Sports Notes. **9.45,** Light Music and Dance Music. **11.0,** Octet in F for Clarinet, Bassoon, Horn and String Quintet (Schubert). **12 Midnight,** Light Music and Dance Music on Gramophone Records. **1.0 a.m. (Monday),** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—10.30 a.m.,** Aus tiefer Not schrei ich zu dir—Cantata (Bach) by the Municipal and Gewandhaus Orchestra, the Choir of St. Thomas' and Soloists. **11.0,** Concert by the Station Orchestra, conducted by Theodor Blumer. **1.0 p.m.,** Weather and Time. **1.5,** The Programme of the Week. **1.25,** Agricultural Notes. **1.35,** Children and Animals before the Microphone. **2.15** (from **Dresden**), Pianoforte Recital of Music by Bach. **2.45,** Report from a Gymnastic Tournament. **3.0,** Concert by the Emde Orchestra, relayed from the Radio Exhibition. **4.30,** Report from the Local Arts and Crafts Exhibition, relayed from **Thalheim, Erzgebirge. 5.0,** Talk: Men—Heroes—Destinies. **5.25,** Recital of Schubert Songs by Carl Erb. **6.0,** See **Berlin (Deutschlandsender). 7.30,** Dances of Luther's Time—Concert by the Genzel Quartet, Prof. Günther Ramin (Harpsichord) and Walter Goetze (Lute). **8.15,** Luther—Radio Play (Eggers). **9.15,** News and Sports Notes. **9.30,** A Report on the Second Half of the International Football Match, Germany v. Switzerland, in Zürich (on Gramophone Records). **10.0,** See **Munich. 11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW.—**12 Noon,** Concert by the Radio Orchestra, conducted by Henri Pensis. **1.0 p.m.,** Gramophone Concert. **7.0** till Close Down, English Evening. **7.0,** Gramophone Concert: Overture, A Night in May (Rimsky-Korsakov); Petroushka (Stravinsky). **7.45,** Concert of English Music by the Radio Orchestra, conducted by Henri Pensis: Overture, The Bohemian Girl (Balfe); In a Fairy Realm (Ketelbey); Demande et réponse (Coleridge-Taylor); Dance of the Dervishes (Bendix); Bird of Love Divine (Haydn-Wood); Nell Gwynne Suite (German); April's Lady (Ancliffe); Selection from The Geisha (Jones). **8.50,** News in French. **9.0,** Concert by the Radio Orchestra, conducted by Henri Pensis. Soloist: Carl Delseit (Pianoforte); Pianoforte Concerto in B flat minor (Tchaikovsky); Overture, Tannhäuser (Wagner). **9.45,** News in German. **9.55,** English Gramophone Music. **10.15,** Dance Music on Gramophone Records.

MADRID

ARANJUEZ, EAQ. 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Programme relayed from **Madrid (EAJ7),** followed by Radio Chroniele. **12 Midnight to 12.30 a.m. (Monday),** Programme in English by the I.B.C. Concert: Rosa del Rio (Alexander); Selection from Viktoria and her Hussar (Abraham); Kissing is no Sin (Eysler); Aloha Oe (Liliuokalani); Montana Call (Stothart); Fiesta (Samuels); The Wave (Metra); On a little Street in Honolulu (Sherman). **12.30 a.m.,** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**8.0 to 9.0 a.m.,** Topical Review. **11.30,** Municipal Band Concert, relayed from the Retiro. **2.0,** Chimes, Time, Theatre Notes and Popular Music. **4.0 to 7.0,** Interval. **7.0,** Chimes, Announcements and Dance Music. **8.30 to 9.30,** Interval. **9.30,** Chimes, Time and Talk on Astronomy. **9.45** (approx.), Music Competition—Pianoforte Recital. After the Recital, Items by Ramon Gomez de la Serna, followed by Flamenco Songs. **12.0 Midnight,** Chimes. **1.0 a.m. (Monday)** till Close Down. I.B.C. Programme of Dance Music: I've found the Right Girl; My Mother's Garden; Mademoiselle; Sing another Line; Flor de Cuba; Happy as the Day is long; Don't blame me; Wood Violets; Aloha Oe!; Sweetheart Darlin'; Blue Cloud; Let's make it up; I bring a Song; Lou'siana Lullaby; Spanish Sweetheart; My Kingdom for a Smile from you. **2.0,** I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**11.15 a.m.,** Concert by the Station Orchestra, conducted by Plichta. **12.30 to 1.25 p.m.,** See **Prague. 2.0,** See **Brno. 4.30,** See **Prague. 6.20,** See **Brno. 7.10** till Close Down: See **Prague. 10.0** (approx.), Close Down.

MOSCOW

KOMINTERN, RW1, 202.5 kc/s, 1,481 metres; 500 kW.—**9.15 a.m.,** A Night in May—Opera (Rimsky-Korsakov). **10.15,** Literary Review. **2.15 p.m.,** Programme for Children. **3.15,** Musical Programme. **3.30,** Educational Programme. **6.30,** Talk on the Forthcoming Chess Match. **7.0,** Baritone Song Recital. **8.0,** Literary Programme in German. **9.5,** A Discussion in English: Purging the Communist Party. **10.5,** Talk in Swedish: The Soviet Union.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**10.30 a.m.,** See **Leipzig. 11.0,** Concert from the Feldherrnhalle. **12 (Noon),** Time, Weather and Programme Announcements. **12.10 p.m.,** Agricultural Talk. **12.30,** Pictures of Nature—a Sequence of Gramophone Records. **1.30,** Elementary Chess Lesson. **2.0,** Zither Recital. **2.20,** Programme to be announced. **2.40,** Concert by Children. **3.10,** Talk: Granite. **3.25,** See **Berlin (Deutschlandsender). 4.10,** Concert conducted by Erich Kloss. **4.45,** Talk: Famous German Leaders made immortal in Folklore. **5.5,** 'Cello and Pianoforte Recital. **5.45,** Weather and Sports Notes. **6.0,** See **Berlin (Deutschlandsender). 7.30 to 9.0,** See **Leipzig. 8.15,** Concert by the Station Orchestra, conducted by Winter. **9.0,** Time, Weather, News and Sports Notes. **10.0,** Serenade by the Small Station Orchestra, conducted by Erich Kloss. **11.0** (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy LCL, 6,990 kc/s, 42.92 metres.**—**9.15 a.m.,** News and Weather. **9.20,** Gramophone Music. **9.55,** Chimes and Divine Service Relay. **4.0,** Light Music on Gramophone Records. **4.45,** Mme. Regina Normann reads from her own Works. **5.15,** Music by a Banjo Quintet. **5.45,** Talk: The Hot Springs of Iceland. **6.15,** Weather and News. **6.30,** Recital of New Norwegian Songs by Haldis Halvorsen. **7.0,** Time Signal. **7.1,** Popular Programme, relayed from Gauldal. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Concert by the Station Orchestra, conducted by Hugo Kramm. **10.0** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

NOV. 19th SUNDAY *continued*

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot signals).—**12.30 p.m.,** Concert by the Jean Ibos Orchestra: Chanteurs des bois (Farbach); Trees (Rasbach); Love's Garden of Roses (Haydn Wood); Nocturne (Ganne); Austria-Hungary (Kéler-Béla). **1.0,** News and Press Review. **1.15,** Concert (contd.): Minuetto (Bolzoni); Ballet égyptien (Luigini); Moorish Serenade (Chapi); Si petite (Claret); Slav Dance (Dvorák). **2.0,** Running Commentary on a Football Match. **3.15** (approx.), Concert relayed from the Salle du Journal. **5.45,** Le Journal Parlé. **7.15,** Weather. **7.25,** News. **7.30,** A Voyage to the Land of Sound Waves—Fairy Play for Radio with Incidental Music. **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**10.0 a.m.,** Selection from The Land of Smiles (Lehár), on Gramophone Records. **10.10,** Press Review. **10.30,** Sponsored Gramophone Concert of Light Music. **11.0,** Jazz Music by the Station Band. **12.15 p.m.,** Extracts from Sound Films on Gramophone Records. **12.45,** Sponsored Programme. **12.50,** Half an Hour of Fantasy by Paul Weill. **1.30,** Sponsored Programme. **2.0,** Interval. **7.0,** Le Journal Parlé. **7.5,** Gramophone Music. **7.20,** Sports Notes. **7.30,** Catholic Review. **8.0,** Classical Music on Gramophone Records. **8.30,** Mais ne te promène donc pas toute nue—One-Act Comedy (Georges Feydeau). **9.20,** Concert. **10.30,** News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**7.0 a.m.,** Gramophone Music. **8.0,** Press Review and Weather. **8.30,** Physical Culture. **9.20,** Advanced English Lesson. **10.0,** Elementary Book-keeping Lesson. **10.20,** Advanced Book-keeping Lesson. **10.40,** Spanish Lesson. **12 Noon,** Religious Address. **12.20 p.m.,** Sacred Music: Improvisation (Vierne). **12.30,** Gramophone Music. In the interval at **12.45,** Press Review, News and Weather. **1.30 to 2.30,** Programme in English by the I.B.C. **1.30,** Gramophone Concert: Bim, Bam, Bulla (de May); Valse des Cols Bleus (Romani); If we had never met (Parys); La Magas (Sentis); Miami (Loyraux); Song of Love (Klenner); Chanson d'une Nuit (Spolianski). **2.0,** Concert of Dance Music: Signature Tune; Happy Feet; Happy and Contented; Hold your Man; What are little Girls made of? When the King goes by; Love locked out; Spanish Eyes; Goodnight, little Girl of my Dreams; The Day you came along. **3.0 to 3.30,** Programme in English by the I.B.C. Concert of Dance Music: Bucking the Wind; Time to go; The Shadow Waltz; Who's afraid of the Big, Bad Wolf? Vocal Selections by Opal Cooper; Don't blame me; You've got everything; Lamento Rosquino; Thanks. **3.30,** Variety Concert. **5.0,** Concert. **7.0,** Popular Music. **8.0,** Radio-Paris Circus. **8.45,** Operetta in Two Acts (Benatzky), relayed from the Empire. In the interval at **8.30,** News, Sports Notes, and Weather, and at **10.0** (approx.), News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**5.30 to 6.30 p.m.,** Radio City Concert, from **New York. 7.0 to 9.30, New York** Relay. **7.0,** Bar X Ranch. **7.30,** Variety Programme. **8.0,** International Tit-bits. **8.30,** Antobal's Cubans. **9.0,** True Railroad Stories. **9.15,** Morin Sisters. **9.30,** Vesper Services. **10.30,** Grand Hotel, from **New York. 11.0,** Pathé News. **11.15,** Weather and Sports. **11.30,** Happy Felton's Orchestra. **11.45 to 2.45 a.m. (Monday), New York** Relay. **11.45,** True Engineering Stories. **12 Midnight,** Vincent Lopez Orchestra. **12.30 a.m.,** Joe Penner. **1.0,** Egon Petri and Orchestra. **2.0,** Gulf Headliners. **2.30,** Walter Winchell. **2.45,** Marvellous Melodies. **3.0,** Orchestral Concert, from **New York.**

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**9.30 a.m.,** Celebration of the Fifty Years' Jubilee of the National Theatre. **11.0,** Chimes. **11.5,** News. **11.15,** See **Moravska-Ostrava. 12.30 p.m.,** Agricultural Programme. **1.0,** Agricultural Talk. **1.15,** Talk: Juvenile Workers. **1.25,** Interval. **3.0,** See **Brno. 4.30,** Talk: America to-day. **4.45,** Gramophone Music. **5.0,** German Transmission: Announcements of the Music Programmes of the Czecho-Slovak Stations, followed by Review of Events and a Detective Play. **6.0,** News. **6.5,** Talk: Forecasting the Weather. **6.20,** See **Brno. 7.10,** Humorous Programme. **7.30,** A Napoleonic Triology—Play (Kyser) Part 3. Waterloo. **9.0,** Time Signal and News. **9.20,** Concert by the Skalicky Orchestra. **10.0** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS 743 kc/s, 403 metres; 25 kW; and **Geneva, 400 kc/s, 749.9 metres.**—**8.40 a.m.** (from **Lausanne**), Chimes. **8.45,** (from **Lausanne**), Protestant Service, relayed from La Chapelle des Terreaux. **10.0** (from **Lausanne**), Gramophone Concert. **11.30,** News and Weather. **11.40** (from **Lausanne**), Gramophone Concert. **1.0 p.m.,** Interval. **1.30,** See **Schweizerischer Landessender. 4.0** (approx.), Interval. **5.0** (from **Lausanne**), Yodel and Accordion Trio Concert. **6.0** (from **Lausanne**), Religious Address. **6.30** (from **Lausanne**), Sports Talk. **7.0,** See **Vienna. 8.15** (from **Lausanne**), Violin and Pianoforte Recital by Annie Mesritz and Carola Pajonk. **9.0,** News and Weather. **9.15** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres,** from **7.45 p.m.;** and **2RO, 11,810 kc/s 25.4 metres.**—**9.0 a.m.,** News, Sports Notes and Amusement Guide. **9.30,** Agricultural Notes. **9.45,** Bible Reading. **10.0 to 11.0,** See **Turin. 11.30,** Gramophone Music. **11.45 to 1.15 p.m.,** See **Turin.** In the interval at **1.0,** Time and Announcements. **3.0 (Naples),** Programme for Children, Weather and Sports Notes. **3.15,** Gramophone Music and Sports Notes. **4.0,** Vocal and Instrumental Concert. Sports Report in the intervals. **5.15,** Sports Report. **5.30 to 5.40** (approx.), Weather. **6.30,** Sports Notes and News. **7.0,** Time and Announcements. **7.30,** Sports Review. **7.45,** Song, Harp and Violin Recital by Enza Motti-Messina (Soprano), Ada Ruata-Sassoli (Harp), and Bruna Franchi (Violin). **9.0** (approx.), Dance Music. **10.0** (approx.), Close Down.

SALZBURG.—See **Vienna.**

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SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**9.0 a.m.** (from **Berne**), Protestant Service. 9.45 (from **Berne**). Chamber Music. **10.20** (from **Berne**). Readings. **11.0,** (from **Berne**), Concert of Marches. **11.30,** Time, Weather and News. **11.40,** (from **Zürich**), Concert by the Station Orchestra. **12.30 p.m.** (from **Berne**). Berne Provincial Programme. **1.30,** Report on the Germany v. Switzerland Football Match. **4.0** (from **Berne**), Fairy Tales from Five Continents. **4.25** (from **Berne**), Gramophone Music. **4.45** (from **Berne**), Sacred Concert. **5.30** (from **Berne**), Talk: The Troubadours and Minstrels of the North. **6.0** (from **Berne**), Time and Sports Results. **6.20,** Concert by the Station Orchestra. **6.45** (from **Berne**). Talk. **8.0,** News. **8.10,** Programme to be announced. **8.50,** Concert by the Station Orchestra. **9.15,** (from **Berne**), Sports Notes and Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**8.0 a.m.,** Rural Programme. **8.30,** Gramophone Music. **9.10,** Talks for Workers. **10.0,** Divine Service, relayed from **Eskilstuna, 1,220 kc/s, 245.9 metres. 11.45,** Weather and News. **1.0 p.m.,** Symphony Concert, conducted by Mowinckel, relayed from **Gävle, 1,470 kc/s, 204 metres. 2.0,** Temperance Talk. **2.30,** Choral Concert, relayed from **Karlstad, 1,382 kc/s, 217 metres. 3.0,** Elementary English Lesson. **3.30,** Programme for Children. **4.5,** Gramophone Music. **4.30,** Reading. **5.0** (from **Sundsvall**), Evensong. **6.15,** Weather and News. **6.30,** The Girl from the Marsh—Play (Selma Lagerlöf). **8.0,** Orchestral Concert, conducted by Tor Mann. Soloist: Olaf Nielsen (Violin). **8.45,** Weather and News. **9.0,** Concert (contd.). **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**10.0 a.m.,** Protestant Service, relayed from St. William's Church. **11.0,** Gramophone Concert of Classical Music. **11.30,** Catholic Service. **12 Noon,** Classical Music on Gramophone Records. **12.45 p.m.,** News. **1.0,** Time Signal. **1.1,** Light Music on Gramophone Records. **2.0,** Agricultural Talk in German.

NOV. 19th SUNDAY *continued*

2.15, Interval. **3.0,** Concert by the Conservatoire Concert Society, relayed from **Paris:** Missa Solemnis in D (Beethoven); Le déluge (Saint-Saëns). **5.0,** Orchestral Concert, conducted by Roskam. **6.0,** Medical Talk. **6.15,** Sports Notes. **6.30,** Pianoforte and Oboe Recital by François Cholé and M. Caron. **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German, Lottery Results, and Announcements. **8.30,** Lilac Time—Musical Comedy in Three Acts (Schubert-Berté), for the 105th Anniversary of Schubert's Death. In an interval at **9.30** (approx.), Press Review in French. **10.20,** Dance Music, relayed from the Savoy. **12 Midnight,** Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**10.30 a.m.,** See **Leipzig. 11.0,** See **Langenberg. 12 (Noon),** Topical Talk. **12.15 p.m.,** Gramophone Music. **1.15,** Agricultural Talk. **1.30,** Swabian Anecdotes. **2.0,** Programme for Children. **3.0,** Concert. Part I, Gramophone Music: Suite for Orchestra, No. 2 in B Minor (Bach); Quartet in F Minor, Op. 95, No. 11 (Beethoven). Part II, Recital of Schumann Songs by Maria Basca (Contralto). Part III, Music by the Station Orchestra, conducted by Ferdinand Drost; Soloist: Maria Basca (Contralto). **5.15,** Report of the International Football Match, Germany v. Switzerland, at Zürich (on Gramophone Records). **6.0,** See **Berlin (Deutschlandsender). 7.30,** See **Frankfurt. 9.20,** Topical Talk. **9.30,** Local News and Sports Notes. **9.45** till Close Down. See **Langenberg. 1.0 a.m. (Monday),** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—**11.0 a.m.,** Dance Music. **11.30,** Operetta Music. **11.45,** Extracts from Sound Films. **12 Noon,** Light Music. **12.30 p.m.,** Catholic Service. **12.45,** Opera Music. **1.0,** Amusement Guide, Market Prices and Time. **1.5,** Songs. **1.15,** Light Music by a Viennese Orchestra. **1.45,** Protestant Service. **2.0,** Light Music. **2.15,** Agricultural Report. **2.30,** Opera Music. **2.45,** Accordion Solos. **3.0,** Recital of Delmet Songs. **3.30,** Light Music. **4.0,** Operetta Music. **4.15,** Opera Music. **4.30,** Chansonettes. **4.45,** Light Music. **5.0,** Dance Music. **5.45,** Music by an Argentine Band. **6.0,** News. **6.15,** Opera Music. **6.30,** Extracts from Sound Films. **6.45,** Music by a Viennese Orchestra. **7.15,** News. **7.30,** Duets. **7.45,** Military Music. **8.0,** Songs. **8.15,** Orchestral Music. **8.30,** Russian Songs and Balalaika Music. **8.45,** Orchestral Music. **9.0,** Concert Version of Faust—Opera (Gounod). **9.45,** Organ Recital. **10.0,** Accordion Solos. **10.15,** News. **10.30,** Concert for Listeners in Morocco: Part I: Chansonettes; Part II: Opera Music. **11.0,** Extracts from Sound Films. **11.15,** Hawaiian Guitar Music. **11.30,** Music by a Viennese Orchestra. **11.45,** Songs. **12 Midnight,** News. **12.5 a.m. (Monday),** Music by an Argentine Band. **12.15,** Military Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**8.40 a.m.,** See **Turin. 8.55,** Mass from the Cathedral of San Giusto. **10.0,** Religious Address. **10.20,** Agricultural Talk. **11.0** (approx.) till Close Down. See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**8.40 a.m.,** Giornale Radio. **8.55 to 9.40,** Interval. **9.40,** Agricultural Talk. **10.0,** Mass from the Church of the Annunciation, Florence. **11.0 to 11.15,** Bible Reading. **11.30,** Gramophone Music. **11.45,** Gramophone Music. **12 Noon,** Time and Announcements. **12.2 to 1.15 p.m.,** Concert of Light Music. **2.0,** Relay of an Opera. **5.0,** Sports Review. **5.15 to 5.20,** Weather. **6.0,** Time, Football Notes, Dopolavoro Report and Gramophone Music. **6.15,** Gramophone Records. **7.0,** News, Sports Notes and Gramophone Music. **7.45,** Symphony Concert on Gramophone Records. Talk in the interval. **9.0,** Orchestral Concert. **10.0,** Giornale Radio.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**2.30 p.m.,** Concert of Chamber Music by the Sedlak-Winkler Quartet and Stella Wang (Pianoforte). **3.30,** Talk: Hawk's Eyries in the Danube Valleys. **4.0,** Concert by the Wilhelm Wacek Wind Instrument Band. **5.30,** Reading from the Works of Richard Dehmel, for the Author's Seventieth Birthday. **6.0,** Concert by the Wiener Symphoniker and the Freie Typographic Choral Society. Part Relay from the Grand Concert Hall. **6.50,** Time, Sports Notes and Programme Announcements. **7.0,** The Folk Music of Austria—Wireless Potpourri (arr. Riedinger); The Vienna Boy's Choir, the Wiener Symphoniker, conducted by Josef Holzer, and Soloists. **8.15,** News and Exchange. **8.30,** Song Recital by Emil Schipper. **9.10,** Serenade by the Karl Haupt Band from the Hotel Krantz-Ambassador. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**8.0 a.m.,** Time Signal and Sacred Music. **8.5,** Gymnastics. **8.20,** Gramophone Music. In the interval at **8.35,** Radio Journal. **8.50,** Hints for the Housewife. **8.54,** Programme Announcements. **9.0,** Divine Service relayed from **Lwów, 788 kc/s, 381 metres. 10.45,** Sacred Music on Gramophone Records. **10.57,** Time Signal and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5,** Programme Announcements. **11.10,** Weather. **11.15,** Concert for the 105th Anniversary of the Death of Schubert: The Philharmonic Orchestra, conducted by Dolzycki; Soloist, Helmholtz (Songs). In the interval, Announcements. **1.0 p.m.,** Agricultural Talk. **1.15,** Agricultural Prices. **1.25,** Dance Music on Gramophone Records, relayed from **Lwów. 2.0,** Talk: The Importance of the State Scientific Institute. **2.20,** Concert by a Village Orchestra. In the interval, News. **3.0,** Programme for Children. **4.30,** Gramophone Records of Rachmaninov (Pianoforte). **3.45,** Reading (Dygasinski). **4.0,** Talk for Women. **4.15,** Concert of Polish Folk Music by the Lutnia Choir and Mme. Szczepanska (Songs). **5.0,** Talk. **5.40,** Gramophone Music. **6.0,** Programme Announcements. **6.5,** Miscellaneous Items. **6.30,** Review of the Week's Events for Young People. **6.45,** Art Notes. **6.50,** Concert by the Station Orchestra, conducted by St. Nawrot; Soloist, Zdzitowiecki (Songs). **7.50,** Radio Journal. **8.0,** Topical Talk. **8.15,** Humorous Programme, relayed from **Lwów. 9.15,** Sports Notes. **9.25,** Dance Music from the Femina Cabaret. In the interval at **10.0,** Weather and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

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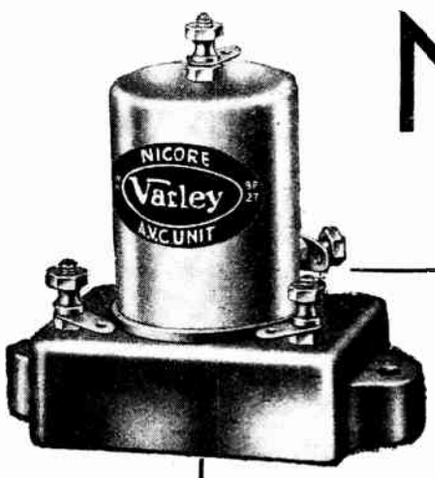

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MONDAY
NOVEMBER THE TWENTIETH

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report. Stock Report, and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gaelic Talk. **7.15,** Talk on Dogs. **7.30,** Time Signal. **7.31,** The Station Orchestra. **8.0,** The Follies Revue Company, with the Station Orchestra. **9.0,** Gaelic Songs. **9.15,** The Station Orchestra. **9.30 to 10.30,** Programme by the I.B.C. (Ireland). Ltd. **9.30,** Orchestral Broadcast. Spanish March, Auguero (Franco); Valse Caprice (Rubinstein); 'Cello Solo, Harlequinade (Squire); Hungarian Rhapsody No. 1 in G minor (Brahms). **9.45,** Pianoforte Recital by Mr. Fred Stone. **10.0,** Concert. How are You? (Pola); Ain't cha coming out to-night (Carson); How do you do Mr. Brown (Abraham); Racing Commentary; Remember my forgotten Man (Dubin); Caroline Lullaby; Street of Dreams (Young); Hustlin' and Bustlin' for Baby (Woods). **10.30,** I.B.C. Goodnight Melody, followed by News and Weather Report. **10.0,** Pianoforte Solos by Carl Hardebeck. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Trio No. 7 in E minor (Haydn); Minuet (Mozart); Meditation from Thais (Massenet); Aria from Louise (Charpentier); Hungarian Dance No. 5 (Brahms). **7.0,** Request Gramophone Records. **7.20,** Sports Notes. **7.30,** Exchange and Talk in Catalan. **8.0,** Gramophone Music and News. **8.30,** Catalan Educational Programme: Geography and History Lessons. **9.0,** Chimes. Weather, Exchange Quotation and Market Prices. **9.5,** Humorous Review of the Week in Verse. **9.15,** Concert of Sardanas. **10.0,** Fauré Song Recital by Carmen Gombau. **10.30,** Catalan Radio Gazette. **11.0,** Press Review. **11.15** (approx.), Operetta Music by the Station Orchestra: Selection from Eva (Lehár); Titin (Szulc); Rose-Marie (Friml); and Die geschiedene Frau (Fall). **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Gramophone Music. **3.55** (approx.) **to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** (approx.), till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—**6.0 p.m.,** Popular Music on Gramophone Records. **6.20,** Talk. **7.30,** Relay of an Opera from the National Theatre. In an interval at **9.0,** Time and News.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**11.5 a.m.** (approx.), Gramophone Concert: Oragn Solo (Flanagan); Butterflies in the Rain (Myers); Nola (Arndt); Waltz, Mado (Vacher); Napolitanita (Vacher); Waltz, An der Donau Melichar); Blue Skies of Hawaii (Lopez); Jeannina (Shilkret); Waltz, Wiener Bürger (Ziehrer); Waltz, Frühlingsstimmen (Joh. Strauss); Tales from the Vienna Woods (Strauss); Edelweiss (Raymond); Dance (Perl); Ein Mann mit Herz (Stolz); Dance in the Moonlight (Plessou). **11.55,** Time Signal. **12 (Noon) to 12.45, p.m.,** Interval. **12.45,** News. **1.0,** Gramophone Concert: Mazurka (Godard); Prelude (Rachmaninov); Potpourri of Verdi Music; Extracts from Die Moldau (Smetana); Minuet (Paderevsky); Movement from the Italian Caprice (Tchaikovsky); Habanera from Carmen (Bizet); Spanish Rhapsody ((Chabrier); Zigeunerweisen (Sarasate). **2.0,** Talk for Women. **2.30,** Weather and Exchange. **2.45,** Review of Books. **3.0,** Concert from **Breslau. 4.0,** Talk: Constructing the Programmes for Schools. **4.25,** Songs from Schubert's Winterreise—sung by Fred Drissen. **5.0,** Poems. **5.5,** Dialogue on Sport for Young People. **5.30,** Talk: A Walk through the East Frisian Nurseries. **5.50,** Weather and Announcements.. **6.0,** Transmission for all German Stations relayed from **Stuttgart. 7.0,** To-day's Motto. **7.5,** Germany greets Selma Lagerlöf—a Radio Sequence on the Swedish Poetess's Seventy-fifth Birthday (Unger). **8.0,** Furtwängler Concert relayed from the Philharmonie. **9.0,** News. **9.45,** Weather. **10.0,** Radio Report of the Six Days' Racing in the Sportpalast, Berlin. **10.10,** Programme from **Langenberg. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB and DJE.—12 (Noon),** Gramophone Concert: Part I—Dances: Sturmgalopp (Komzak); Rheinländer, Lang ist's her; Rheinländer, Helmatklänge; Tango, Du bist die Frau für mich; Polka for Accordion; Foxtrot, Sternschnuppen; Luna-Walzer (Lincke); Pizzicato Polka (Jos. Strauss); Gallop, Im D Zug (Komzak); Quadrille from Die Fledermaus (Joh. Strauss). Part II—Music by Schubert: Talk on Schubert's Life and Work, with Gramophone Illustrations; Andante un poco mosso from the Trio in B flat for Violin, 'Cello and Pianoforte; Pianoforte Solos: (a) Moment musical, Op. 94. No. 3, (b) Impromptu in G, Op. 90; Ständchen; Second and Third Movements from the Symphony No. 3 in D. In the interval at **12.40 p.m.,** Weather and News. **2.0,** Exchange. **2.20,** Talk: The Law and Photography. **2.30,** A Visit to Helen Braun. **3.0,** Recital of Peter Cornelius Songs by Margete Vogt-Gebhardt (Soprano): Veilchen; Wiegenlied; Nachts; Denkst du an mich; Untreu; In Lust und Schmerzen; Komm, wir wandeln zusammen; Möcht' im Walde. **3.15,** Reading (Wolfgang Hermann). **3.30,** Thé Dansant. **4.30,** Review of Books. **5.0,** Herybert Menzel reads from his own Poems. **5.10,** Pianoforte Recital: The Fifth Württemberg Sonata in E Flat (Phil. Em. Bach); Three Pieces (Wilh. Friedeman Bach): (a) Fugue in D Minor, (b) Fugue in B flat, (c) Polonaise in E flat Minor, (d) Polonaise in C. **5.30,** The Funkstunde informs its Listeners . . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations relayed from **Stuttgart. 7.0,** Lottery Announcements. **7.5,** The Maid from the Marsh (Selma Lagerlöf) arranged for Radio by Herbert Günther. **8.0,** See **Breslau. 9.0,** News. **9.15** (approx.), Dance Music. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.30,** News and Racing Results. **7.35,** Talk: Bordeaux a Century Ago. **7.50,** Charades. **8.0,** Gramophone Music. **8.15,** News. **8.80,** See **Strasbourg.**

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—**5.5 p.m.,** Gramophone Records. **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.10,** See **Moravska-Ostrava. 6.55,** Baron Trenck—Operetta in Three Acts (Albini). **9.0,** See **Prague. 9.15** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—10.50 a.m.,** Weather. **10.55** (approx.), Concert by the Station Orchestra, conducted by Ewald Rischka. In an interval from **12.45 to 1.10 p.m.,** Time and News. **1.30,** Programme arranged by the Post Office, with Gramophone Records. **1.40,** Market Prices. **2.0,** Gramophone Records of Light Music. **3.0,** Concert from the Café Vier Jahreszeiten. **4.0,** Review of Books about America. **4.20,** Market Prices. **4.25** (approx.), Concert from the Café Vier Jahreszeiten (contd.). **5.0,** See **Leipzig. 5.30,** See **Berlin (Deutschlandsender). 5.50,** Meat Market Prices. **6.0,** Transmission for all German Stations, relayed from **Stuttgart. 7.0,** News. **7.10,** Talk: Ludwig Richter, the German Painter-Poet. **8.0,** Brahms' Concert by the Müddemann Women's Choir. **9.0,** See **Munich. 9.20,** Time and News. **9.50,** Wireless Technical Talk. **10.0,** Dance Music by a Cigány Band. **12.5 a.m. (Tuesday),** Concert by the Silesian Philharmonic Orchestra, conducted by Rischka. Soloist: Gerhard Bertermann (Baritone): Sinfonia piccola (Atterberg); Norwegian Melody (Grieg); Songs (Schubert): (a) Dem Unendlichen, (b) Hoffnung, (c) Aufenthalt; Tanz der Binnen (Max von Schillings); Songs: (a) Liebe (Max von Schillings), (b) Freude soll in deinen Werken sein (Max von Schillings), (c) Der König (Graener), (d) Der Königin (Graener); Suite, Aschenputtel (d'Albert); Overture, Der Freischütz (Weber). In an interval from **12.30 to 12.45 a.m.,** Talk on Selma Lagerlöf. **1.45** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**4.5 p.m.,** Literary Talk. **4.15** See **Prague. 4.50,** Recital of English Songs by Zinda Wachtlová. **5.0,** Topical Talk. **5.15,** See **Prague. 5.25,** German Transmission: News, followed by Talks. **6.0,** See **Prague. 6.10,** See **Moravská-Ostrava. 6.55,** See **Bratislava. 9.0** till Close Down, See **Prague. 9,30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Concert: Selection from La Mascotte (Audran); Fantasia on Tiens! voilà Mathieu (arr. Dautzenberg); Selection from Miss Decima (Audran); Melody (Montellier); Selection from Le petit due (Lecocq). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: March (Blangenois); Four Walloon Dances (Derouette); Violin Solo: Mazurka (Musin); Dance and cortège (Leblanc); Improvisation (Guillaume); Trio: Ainsi sera toujours (Goflin); 'Cello Solo: Poème (Barbier); Crâmignons Hégeois (Meuron). **5.0,** Concert by the Radio Orchestra, conducted by Franz André: Tableaux musicaux (Daneau); Flirt Serenade (Van Holft); Suite, An Evening in Lilliput (Berry); Violin and Orchestra: Danse and cadence orientale (Marsick); Selection from Rigoletto (Verdi). **6.0,** Talk: Walloon Dialects. **6.15,** Gramophone Concert of Variety Music. **7.15,** Walloon Notes. **7.30,** Theatre and Cinema Review. **8.0,** Dramatic Programme, relayed from the Trocadéro Theatre, Liege. In the interval at **8.30,** Talk, and at **8.45,** Song Recital by C. Lambou. **9.15,** Comedy with Incidental Music. **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans: Military March (Schubert); Fantasia on Spanish Airs (Broustet); Donauwellen (Ivanovici); Pianoforte Solo: Cadiz (Albeniz); Negro Lullaby (Clutsam); Selection from Le Pavillon d'Armide (Tcherepnine); Scènes tziganes (Infante); Transaktionen-Walzer (Strauss); Grieg Fantasia (Urbach). **1.0 p.m.,** Le Journal Parlé. **1.10,** Act 2 of The Barber of Seville—Opera (Rossini) on Gramophone Records. **5.0,** Concert by the Station Symphony Orchestra, conducted by Kumps: Overture, La Princesse Jaune (Saint-Saëns); Interlude from Mignon (Thomas); Scènes alsaciennes (Massenet). **5.45,** Programme for Children. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Ethiopian March (Filipucci); Valse caprice, Puck (Hern); Selection from Samson and Delilah (Saint-Saëns); Suite, Conte d'avril (Widor); Waltz (Ziehrer). **7.15,** Talk on the Fiftieth Anniversary of the Institute for Deaf Mutes and the Blind at Berchem-Ste-Agathe. **7.30,** Theatre Review. **8.0,** Overture, Euryanthe (Weber) on Gramophone Records. **8.8,** A Radio Play (Dirick). **8.45,** Jef Mennekens reads from his own Works. **9.0,** Concert by the Station Symphony Orchestra, conducted by Kumps: Overture, Phèdre (Massenet); Symphonic Variations (Gilson); Songs from De Nachtegaal (Baeyens), accompanied by the Composer; Ballet Music from Milenka (Blockx). **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert by the Station Orchestra. March (Blankenburg); Waltz, Estudiantina (Waldteufel); Celtic Overture (Foulds); Selection from La Wally (Catalani); Ballet Music from Frau Luna (Lincke); Selection from The Rose of Stamboul (Fall); Melody (Ketelbey); Canto amoroso (Sammartini); Souvenir de Bitolla (Karastoyanov). In the interval at **5.0,** Radio Journal and Songs. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.40,** Talk. **7.0,** Quartet in G minor (Fauré), by the Metzner Quartet. **7.30,** Talk. **7.45,** Clarinet Solos. **8.15,** Recitations. **8.45,** Radio Journal. **9.0,** Romanian Music by the Station Orchestra, conducted by Dinico.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **6.30 p.m.** till Close Down. **4.0 p.m.,** Concert by the Losonczi Schweitzer Orchestra from the Café Spolarich. **5.0,** German Lesson. **5.30,** Recital by Alexander Farkas (Songs), and Polgar (Pianoforte). **6.0,** Recitations. **6.30,** Concert by the Philharmonic Society, conducted by Ernst Dohnanyi, relayed from the Royal Hungarian Opera House. Soloist: Emanuel Feuermann ('Cello). Rondo (Zador); 'Cello Concerto (Schumann); Symphony No. 3 (Beethoven). **9.0,** News. **9.10** (approx.), Concert by the Simi Kurinà Cigány Band. **10.15,** Concert by the Mandits Dance Band, relayed from the Café Patria. Soloist: Julius Szantho.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY.—11.0 a.m.,** Time and Chimes from the Town Hall. **11.5,** String Ensemble Concert, relayed from the Hotel d'Angleterre. **1.0 p.m.,** Interval. **2.20,** Talk for the Housewife. **2.30,** Concert by Louis Preil's Instrumental Ensemble. In the interval at **3.15** (approx.), Reading. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk. **5.15,** Elementary English Lesson. **5.45,** Weather and Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Review of Politics. **7.0,** Chimes from the Town Hall. **7.5,** Talk. **7.30,** Viennese Waltzes by the Station Orchestra, conduoted by Fritz Mahler: Die Schönbrunner (Launer); Morgenblätter (Joh. Strauss); Gold and Silver (Lehár). **7.55,** A Day with Marie Antoinette—Harpsichord and Song Recital by Folmer Jensen and Edith Dam: Harpsichord Solos: Le rappel des oiseaux (Rameau); Talk; Songs with Harpsichord Accompaniment: (a) Amente, (b) C'est mon ami, (c) Venez, agréable printemps, (d) Plaisir d'amour. **8.40,** Choral Concert on Gramophone Records: Bridal Chorus from Lohengrin (Wagner); Chorus from Act 2 of The Magic Flute (Mozart); Chorus from Act 2 of Rigoletto (Verdi); Extract from Et Bondebryllup (Söderman); Chorus (Nitschinsky). **9.0,** News. **9.15,** Mozart Concert by the Station Orchestra, conducted by Fritz Mahler. Soloist: Ole Frosig (Clarinet). Overture, Titus; Clarinet Concerto in A; Nachtmusik. **10.0,** Dance Music relayed from the Palace Hotel. **11.0** (in an interval), Time and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour: Part I—Orchestral Concert. Signature Tune; Le Pas des fleurs (Delibes); Life in the Vienna Prater (Translateur); Fluttering Birds (Gennin); Song: The Blackbird in the Apple Tree (Lubbock); Sicilietta (von Blon); Sari Waltz (Kálmán); Violin Solos: (a) The Lark (Tchaikovsky), (b) Melody (Gluck); Souvenir d'amour (Chuckerbury). Part II—Dance Music. Goofus; How could we be wrong; Everyone loves my Marguerite; Dinner at Eight; Shadows on the Swanee; Tick, Tock; Throw open wide your Window; If I had someone to love; Signature Tune. **12 Noon to 3.30 p.m.,** Programme in French. **3.30 to 6.0,** Programme in English by the I.B.C. **3.30,** Choral and Orchestral Selections: Orchestra: Invitation to the Waltz (Weber); Nellie Gray (Slater); Come to the Fair (Easthope Martin); Selection from "Die Fledermaus" (Joh. Strauss); Passing By; The Rogue Song; Old Man River (Kern); Orchestra: Moonlight on the Alster (Fetras). **4.0,** Military Music: Enchantress March (White); Waltz, Les Sirènes (Waldteufel); Lé Grenadier (Mohr); The Skaters' Waltz (Waldteufel); La Bénédiction des Poignards (Meyerbeer); The Hunt in the Black Forest (Voelker); The Teddy Bear's Picnic (Bratton); Selection from Ruy Blas (Mendelssohn). **4.30,** The I.B.C. Nursery Corner with Columbus and Belinda: Birthday Greetings and Trumpets. **4.40,** Orchestral Concert for Chichester and Bognor Listeners: Signature Tune, The Night by the Sea; Persian March (Friml); In the Valley where the Bluebirds sing (Salman); Beautiful (Gillespie); The Coon among the Chickens (Ives); The Cuckoo Song (Norton); Princess Pat (Herbert); Memories of Paris (Moretti); Pianoforte Solo: Why waste your tears (Holstein); Vienna, Vienna (Foss); Waltz, Gold and Silver (Lehár). **5.20,** Concert of Light Music for Hastings and Eastbourne Listeners: The Clock is Playing (Blaauw); Banjo Solo: Finger Tricks (Pietro); The Dance of the Raindrops (Reeves); My Girl ran away (Steinberg); Rosa Mia (Guizar); Second Serenade (Heykens); Song: My Mother's Garden (Hanley); Banjo Solo: The Wedding of the Painted Doll (Brown); Never too Old (Allan); Pianoforte Medley: The Desert Song (Romberg); La Czarine (Ganne); Signature Tune. **6.0 to 10.0,** Programme in French. **10.0** till Close Down, Programme in English by the F.B.C. **10.0** (approx.), Accordion Band Music: Cocktails (Cuvilier); By the Shimmering Twilight Sea (Williams); Song: Sundown in a little Green Hollow (Baskette); My Alphonse (Alexander); Signorina (Brown); Song: Sweep (Ellis); Au printemps (Alexander); Marietta (Charlier). **10.30,** Dance Music: Signature Tune, Bells of Normandy; Moth around the Candle Flame; If you'll say Yes Chérie; The Last Round Up; Shadows on the Swanee; Dawn in Montmartre; Morning, Noon and Night; My Moonlight Madonna; Oh Johanna; Signature Tune. **11.0,** Talkie Time: Signature Tune, Sittin' in the Dark; The Shadow Waltz; Gipsy, sing for me; Selection from This Week of Grace; Black Moonlight; Pianoforte Solo: My heart stood still; A nous la liberté; Vilja Song; A Girl like Nina; Signature Tune. **11.30,** Club Concert for Warwick Listeners: Signature Tune, The Chum Song; Lazy Pete (Werner); Pianoforte Solo: Dancing Butterfly (Young); Song: It's Winter again (Hoffmann); La Paloma (Yradier); Selcetion from The Chocolate Soldier (O. Straus); Dainty Lady (Peter); Tesoro Mio (Becucci); Gridiron Club March (Sousa). **12.5 a.m. (Tuesday),** Late News Bulletin in English. **12.10** (approx.), Club Concert (contd.): What a Perfect Combination; Lover, Isn't it Heavenly; Lazy bones; Sundown in a little Green Hollow; Signature Tune. **12.30,** Dance Music: Aloha Oé; Lover's Lane; My Kingdom for a Smile from you; Don't Blame me; At the Old Pig and Whistle; From me to you; Rosa Mia; About this time next Week. **1.0,** Dance Music: Signature Tune, Bells of Normandy; Cecilia Mia (Frontela); The Wedding of Mr. Mickey Mouse; Dinner at Eight; Good-night little Girl of my Dreams; Egypt; Trouble in Paradise; Sing another Line; I bring a Song;

I've found the Right Girl; Isn't this a Night for Love; Tick, Tock; Nunca; Everyone loves my Marguerite; Throw open wide your window dear; Dancing Butterfly; It's the Talk of the Town; Signature Tune. **2.0,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel and Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** Gramophone Concert. Part I.—Love Songs and Duets. Duet from The Merry Wives of Windsor (Nicolai); Aria from Rigoletto (Verdi); Duet from Der Rosenkavalier (Richard Strauss); Duet from Don Giovanni (Mozart); Aria from The Barber of Seville (Rossini); Song from A Night in Venice (Joh. Strauss); Song from Der Bettelstudent (Millöcker). Part II.—Overtures to Comic Opera. Overtures to The Thieving Magpie (Rossini), The Bartered Bride (Smetana) and The Barber of Bagdad (Cornelius). **1.40,** Old German Folk Songs, sung to the Lute. **2.30,** Weather. **2.40,** Time and Exchange. **3.0,** See **Langenberg. 5.0 to 5.35,** See **Stuttgart. 5.35,** Talk on Konrad Ferdinand Meyer, on the Thirty-Fifth Anniversary of his Death. **5.50,** News and Time Signal. **6.0,** Transmission for all German Stations, relayed from **Stuttgart. 7.0,** Topical Talk. **7.10 to 9.0,** See **Langenberg. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News and Weather. **9.40,** See **Langenberg. 10.0,** See **Berlin (Deutschlandsender). 10.10 to 12 Midnight,** See **Langenberg. 12 Midnight,** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres,** and **Kiel, 1,292 kc/s, 232.2 metres.**—**6.0 p.m.,** Transmission for all German Stations, relayed from **Stuttgart. 7.0,** Concert of Popular Music by the Small Station Orchestra, conducted by Adolf Secker. Soloists: Erna Kroll-Lange and Otto Stadelmaier (Songs), and Bruno Micksche (Violin); Overture, Mignon (Thomas); Two Songs (Schubert): (a) Nacht und Träume, (b) Der Musensohn; Invitation to the Dance (Weber); Extracts from the First Suite from Peer Gynt (Grieg); Violin Solo: Romance (Svendsen); Duet from the First Act of Carmen (Bizet); Selection from Madame Butterfly (Puccini); Songs: (a) Du meines Herzens Krönelein (Richard Strauss), (b) Zur Drossel sprach der Fink (d'Albert); Overture, The Land of Smiles (Lehár); Waltz, Gold and Silver (Lehár). **8.30,** Talk on Selma Lagerlöf, on her Seventieth Birthday, with Readings from her Works. **9.0,** News. **9.20** (from **Hanover**), Concert of Light Music from the George Palast. **10.10** (from **Bremen**), Concert of Light Music from the Europa Café.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**12.5 p.m.,** Strauss Concert on Gramophone Records. Lorelcy-Rheinklänge (Joh. Strauss, Sen.); Annen-Polka (Joh. Strauss); Entry March from The Gipsy Baron (Joh. Strauss); Overture, Der lustige Krieg (Joh. Strauss); Tritsch Tratsch (Joh. Strauss); Perpetuum mobile (Joh. Strauss); Ständchen (R. Strauss); Liebesszene (R. Strauss); Donauweibchen (Joh. Strauss); Sphärenklänge (Joh. Strauss); All mein Gedanken (R. Strauss); Hat gesagt, bleibst nicht dabei (R. Strauss); Wiegenlied (R. Strauss); Selection from Salomé (R. Strauss). In the intervals at **12.20** and **1.0,** News. **1.40,** Handwork for Boys. **2.0,** Agricultural Prices and Exchange. **2.35,** Talk: Winter Sports. **3.0,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. Jubilaums. Ouvertüre (Kéler-Béla); In the Village (Tchaikovsky); Selection from Swan Lake (Tchaikovsky); Selection from Romeo and Juliet (Gounod); Suite, No. 3 (Micheli); Waltz, Ins Zentrum (Joh. Strauss)); Mignon-Mignonne (Körner); Intermezzo from The Jewels of the Madonna (Wolf-Ferrari); Poetic Suite (Dvorak); Overture, Ten Maids and no Man (Suppé). In the interval at **4.0,** Book Review. **4.55,** Elementary English Conversation. **5.15,** Agricultural Prices. **5.25** (from **Danzig**), Talk: The History of the Danzig Armoury. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Stuttgart. 7.0,** News. **7.10,** Reading: Meli (Selma Lagerlöf) for the Seventy-fifth Birthday of the Authoress. **7.35,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. The Nutcracker Suite (Tchaikovsky); Waltz, Märchen aus dem Orient (Joh. Strauss); Overture, The Princess in the Golden Slippers (Rust); Overture, Consalva (Azzoni); Selection from Lilac Time (Schubert-Berté); Waltz, Dorfschwalben aus Oesterreich (Joh. Strauss). **9.0,** News and Sports Report.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to **5.40 p.m.,** and 20 kW from **5.40 p.m.**—Programme of the General Broadcasting Society (A.V.R.O.). **10.40 a.m.,** Organ Recital, with Soprano Solos. **11.40,** Time Signal. **11.41,** Concert of Light Music by Kovacs Lajos and his Orchestra. **1.55 to 2.10 p.m.,** Interval. **2.40,** Quartet in F, Op. 96 (Beethoven) by the Æolian Quartet. **3.10,** Talk. **3.30,** Gramophone Music. **3.35,** Quartet in E flat minor, Op. 80 (Tchaikovsky) by the Æolian Quartet. **4.10,** Talk: New Films and Film Stars. **5.10,** Organ, Tenor and Violin Recital. Pierre Palla (Organ), Henk Viskil (Tenor), and Boris Lensky (Violin). Overture, Zampa (Hérold); Duets for Violin and Organ: (a) Broken Melody (Biena), (b) Leggenda d'amore (Becce), (c) Poupée valsante (Poldini-Kreisler); Viennese Dances (Friedemann-Gärtner); Songs: (a) Aria from Rigolette (Verdi), (b) Aria from Manon (Massenet), (c) Romance from The Pearl Fishers (Bizet); Duets for Violin and Organ: (a) Ballet Movement on a Theme of Gluck (Manén), (b) Scherzando (Dushkin), (c) Paraphrase on a Minuet (Kreisler); Songs: (a) Gruss und Kuss, Veronika (Wachsmann), (b) Kind, ich freu' mich um dein Kommen (Jurmann-Kaper-Dostal), (c) Der schönste Gedanke (Abraham), (d) Im Prater blüh'n weider Die Bäume (Stolz), (e) Song of Songs (Moya), (f) Beautiful Isle of Somewhere (Fearis); Potpourri (Dostal). **6.40,** Talk. **7.10,** Suite in Old Style, Op. 93 (Reger), by Henriette Bosmans (Pianoforte) and Francis Koene (Violin). **7.40,** Time, Weather and News. **7.45,** Concert by the Wireless Orchestra, conducted by Nico Treep. Soloist: Gretl Vernon (Soprano); March from The Love Parade (Schertzinger); Songs: (a) For you alone (Geehl), (b) Under Heaven's Blue, (c) Ay, Ay, Ay (Freire); Diamanten und Perlen (Dostal); Moroccan Patrol (Jessel); Im Märchenwald (Ganglberger); Songs: (a) Song (Rotter), (b) Song from Paganini (Lehár), (c) The Blue Danube (Joh. Strauss); Selection from The Vagabond King (Friml); Jungle Drums (Ketelbey); Doll and Goblin (Armandola); Her first Dance (Heykens); The Gladiators' Farewell (Blankenburg). **9.10,** Prince William of Orange—Play (van Moerkeken). **9.45,** Radio Report by an Eye Witness of the Six Days' Racing at Amsterdam. During the intervals, Items by the Wireless Orchestra, conducted by Nico Treep. In the interval at **10.40,** News. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW from **3.40 p.m.**—Programme of the Christian Radio Society (N.C.R.V.).—**11.40 a.m.,** Police Notes. **11.55,** Gramophone Music. **12.10 p.m.,** Organ Recital by Zwart. Passacaglia (Bach); Sonata No. 6 (Mendelssohn); Concerto in F (Handel); Suite (Zwart); Gothic Suite (Boëllmann); Sacred Music (arr. Zwart). **1.40,** Broadcast for Schools. **2.15,** Gramophone Music. **2.25,** Programme for Women. **2.55,** Dressmaking Lesson. **3.25,** Interval. **3.40,** Bible Reading with Songs and Organ Solos. **4.40,** Gramophone Music. **4.55,** Concert by a String Quintet. Am Spinnrädchen (Ritter); Chant des fleurs (Lange); Hearts and Flowers (Czibulka); A Dream (Ritter); March (Teeseling); Gramophone Records. Plantation Tunes (Smits, Jr.); Russian Potpourri (Teeseling); Waltz, Donauwellen (Ivanovici); March, Old Comrades (Teike). **6.10,** Answers to Correspondence. **6.40,** Police Notes. **6.55,** Religious News. **7.10,** Answers to Correspondence (Contd.). **7.40,** Concert by the Salvation Army Band and Choir. Soloist: Mme. Randwijk-Mühlensteth (Songs). **9.10,** Concert of Chamber Music. Quintet in E Flat (Mozart); Septet in E Flat, Op. 20 (Beethoven). In the interval at **9.40** News. **10.40,** Gramophone Music. **11.10,** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results and News. **8.10,** Sports Notes. **8.20,** Literary Review. **8.35,** Radio Concert. **9.0,** News and Weather. **9.15,** Dramatic Programme.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.,** News and Weather. **12.35,** See **Frankfurt. 1.30,** Meat Market Prices. **2.0,** Talk: New Laws regarding German Patents. **2.15,** Legal Talk. **2.30,** Market Prices. **2.50,** Political Announcements. **3.0,** Concert: Part I—Dance Music by the Station Dance Band; Part II—Folk Songs (Schulz) by the Station Choir, the Station String Quartet and Children's Choir: Soloists: Lieselotte Mann (Contralto), Heinz Hoersch (Tenor) and Egbert Grape (Pianoforte); Part III—Gramophone Records. **5.0 to 5.50,** See **Stuttgart. 5.50,** Announcements. **6.0,** Transmission for all German Stations relayed from **Stuttgart. 7.0,** See **Frankfurt. 7.10,** Bunte Stunde. **8.0,** Brahms Concert by the Station Orchestra, conducted by Buschkötter; Soloists: Karin Schenck (Contralto), Walter Schneiderhan (Violin), Robert Grote ('Cello), and Hans Haass (Pianoforte); Rhapsody, Fragments from Goethe's Harzreise for Contralto, Male Voice Choir and Orchestra; Trio in B; Variations on a Theme of Haydn. **9.0,** See Frankfurt. **9.20,** See **Stuttgart. 9.30,** News and Sports Report. **9.40,** Gramophone Records. **10.0,** See **Berlin (Deutschlandsender). 10.10,** Yesterday and To-day—Concert by the Station Orchestra and Dance Band, conducted by Kühn. **11.0,** Brahms Concert on Gramophone Records: Tragic Overture, Op. 81; Pianoforte Concerto No. 1 in D minor, Op. 15. **12 Midnight,** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**11.0 a.m.,** Gramophone Concert of Variety Music. **12.15 p.m.,** News. **12.30** (from **Dresden**), Concert by Pepi Stoss and his Viennese Schrammel Trio. **1.15,** News. **1.30,** Talk: The Centenary of the Birth of Wilhelm Dilthey. **1.40,** German Classics: The Tales of Baron Münchhausen. **2.0,** Literary Programme for Young People. **2.35,** Economic Notes. **3.0** (from **Dresden**), Concert by the Kaufmann Orchestra, conducted by Arno Kaufmann, relayed from the Radio Exhibition. **4.30,** Talk: The Battle of the Tanks at Cambrai. **5.0,** Discussion: Patriotic and National Art. **5.20,** Sketches from German East Africa. **5.40,** Economic Notes, and News. **6.0,** Transmission for all German Stations, relayed from **Stuttgart. 7.0,** Instrumental Concert. **8.0** (from **Dresden**). Concert by the Dresden Soloist Ensemble: Overture, Regina (Rossini); Dance Airs (Kienzl); Air from Mascarade (Nielson); Ballet Music from King Manfred (Reinecke); Suite, In Memoriam (de Micheli); 'Cello and Pianoforte: Canzonetta (Blumer); Violin, 'Cello and Pianoforte: Walzer-Momente (Schütt); Selection from Der Evangelimann (Kienzl); Mazurka from The Blue Mazurka (Lehár); Selection from Frühlingsluft (Jos. Strauss-Reiterer). **11.30,** Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.,** Talk for Women. **5.30,** Talk on Science. **6.0,** Gramophone Music. **6.30,** Foreign Press Review. **7.0,** Gramophone Music. **7.30,** See **Belgrade.** In an interval, Weather and News.

LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW. Latvian Evening.—**7.0 p.m.,** Concert by the Radio Orchestra, conducted by Henri Pensis: Overture, Prometheus (Beethoven); The Nutcracker Suite (Tchaikovsky); Caprice Moszkowsky); Brise de Mer (Leoncavallo); Madrid (Pesse); Petite Suite (Debussy). **8.0,** Latvian Music on Gramophone Records: Marche solennelle (Straume); Air from Orchestral Suite No. 1 (Medins). **8.15,** Concert by the Radio Orchestra, conducted by Henri Pensis: Overture, Semiramis (Rossini); Berceuse (Vreuls); Selection from Tosca (Puccini). **8.50,** News in French. **9.0,** Gramophone Concert of Popular Latvian Music, by the Reiter Choir and Adolphe Kaktins (Baritone). In the interval at **9.15,** Talk in French on Latvia, by the Latvian Consul. **9.45,** News in German. **9.55,** Gramophone Music: Puccini Potpourri (Weber); Selection from I Pagliacci (Leoncavallo); Selection from La Boutique fantasque (Rossini-Respighi). **10.20,** Dance Music.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Concert of Chamber Music: Divertissement sur des airs russe (Rabaud); Entr'aete from La Navarraise (Massenet); Minuet for Strings (Bolzoni); Les petits soldats de plomb (Pierné); Pastorale d'été (Honneger); Concertante for Four Violins and Orchestra (Maurer); Ballet Music from Les petits riens (Mozart); Concerto Grosso in Four Movements (Lazar); Horn Solo: Pavane pour une Infante défunte (Ravel); Hymn to St. Cecilia (Gounod); Ballet Music from Le Cid (Massenet). After the Concert, News.

MADRID

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Light Music. **10.45,** Radio Chronicle. **11.0,** Catalonian Programme. **12 Midnight to 12.30 a.m. (Tuesday),** I.B.C. Concert: Selection from The Flower of Hawaii (Abraham); Star Song; Capullito de Alheli (Lecuevas); Hot Feet (McHugh); Tiptoe through the Tulips (Dubin); The Cuban Love Song (Stothart); Amalio; The Regiment of Peace (Reisfeld). **12.30,** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Topical Talk and Dance Music. **8.15,** Radio Journal. **8.30** (approx.), Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**6.10 p.m.,** Talk. **6.25,** Radio Report from the Laboratory of an Iron-Works. **6.55,** See **Bratislava. 9.0,** See **Prague. 9.15** (approx.), Close Down.

MOSCOW

KOMINTERN, RW1, 202.5 kc/s, 1,481 metres; 500 kW.—**3.15 p.m.,** Musical Programme. **3.30,** Agricultural Talks. **4.30,** Red Army Programme. **5.30,** Programme for Workers on Collective Farms. **6.30,** Technical Talk. **7.0,** Concert by the Station Orchestra, with Songs. **8.0,** Talk in German: Work on a Collective Farm. **8.55,** Chimes from the Red Square. **9.5,** Talk in English: The Story of a Factory, Part I. **10.5,** Talk in Hungarian: Purging the Communist Party.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**3.30 p.m.,** Orchestral Concert, conducted by Erich Kloss. **4.45,** Talk for Young People. **5.5,** Recital on Two Pianofortes: Brandenburg Concerto No. 3 (Bach); Perpetuum mobile (Müller-Rehrmann). **5.25,** Talk. **5.45,** Time, Weather, and Market Prices. **6.0,** Transmission for all German Stations, relayed from **Stuttgart. 7.0,** Concert by the Station Orchestra, conducted by Karl List. **7.50,** In der Kunkelstub'n—Tales of Witches, Spirits, and Ghosts—and a Short Ghost Play, Die Teufelsnacht (Richard Billinger). **8.35,** Gramophone Concert: Song from The Gipsy Baron (Joh. Strauss); Xylophone Solo, Blutrote Herzen; Variety Items; Song from Bezauberndes Fräulein Benatsky), Siciliana; Waltz from Der Walzerkrieg (Joh. Strauss); Waltz Song, Die Dorfmusik (Fryberg). **9.0,** Austria. . . . **9.20,** Time, Weather, News, and Sports Notes. **10.10** (approx.), See **Langenberg. 11.0** (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres Rjukan, 671 kc/s, 447.1 metres;** and **Jeloy, CLC, 6,990 kc/s, 42.92 metres.**—**4.0 p.m.,** Light Music. **5.0,** German Lesson. **5.30,** Talk. **6.0,** Announcements, Weather and News. **6.30,** Talk: Earthquakes. **7.0,** Time Signal. **7.1,** Pianoforte Recital relayed from **Stravanger, 1,247 kc/s, 240.6 metres. 7.25,** Recitations relayed from **Stravanger. 7.40,** Choral Concert of German Songs. **8.10,** Political Review. **8.40,** News and Weather. **9.0,** Topical Talk. **9.15,** Balalaika Concert of Russian Music. **9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements. Tourist Report, Agricultural Notes, Report of the Royal Geographical Society and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Concert of Chamber Music; L. Giacchino (Pianoforte), T. Giacchino ('Cello), Michele Diamante (Flute) and Esmeralda Corti (Soprano): Pianoforte and 'Cello Duets: (a) Adagio (Haydn), (b) Sonata (Marcello); Flute Concerto (Mozart); Soprano Solos: (a) Sogno (Tosti), (b) Visione veneziana (Brogi); 'Cello Solos: (a) Orientale (Cui), (b Spanish Serenade (Cassado); Flute Solos: (a) Siciliana (Bach), (b) Scherzo (Andersen); Soprano Solos: (a) Quando men vo soletta (Puccini), (b) Occhi (Croce); Pianoforte Solos: (a) Prelude and Fugue (Mendelssohn), (b) Two Pieces (MacDowell): (a) Moonshine, (b) Andalusian Dance. After the Concert, Light Music on Gramophone Records. **10.0,** Giornale Radio.

NOV. 20th MONDAY *continued*

NOV. 20th MONDAY *continued*

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and G-dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.15,** Weather. **7.25,** News. **7.30,** Versailles Orchestral Concert, conducted by Flament: Overture, Une journée à Versailles (Delmas); Marche des gardes françaises (Wetzel); Bal à la cour (Thomé); Les courtisans (Staub); Symphonic Poem, Versailles (Geloso); Fête galante (Lacôme). **8.0,** Political Review. **8.15,** Orchestral Concert (contd.): Quand chassait le roi, quand dansait la reine (Flament); Ballet Music, Louis XIV (Pouget); Hofballtänze (Joh. Strauss). **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Selection from La Bohème (Puccini), on Gramophone Records. **7.10,** Science Talk. **7.15,** Le Journal Parlé. **7.30,** Hot Jazz on Gramophone Records. **8.0,** Talk on Motor Cars. **8.30,** Review of the Month by Max Régnier and his Company. **9.20,** Gala Concert. **10.20,** News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** Press Review and Weather. **12 Noon,** Gramophone Concert. España (Blanco); Quadrille from La Mascotte (Audran); Polka, Merle et pinson (Reynaud); Selection from Mascarade (Lacôme); Overture, Semiramis (Rossini); Messager d'amour (Wittmann); Selection from Les deux pigeons (Messager); Military March (Saint-Saëns). **1.0,** Exchange, News and Weather. **1.5,** Pianoforte Recital by Mlle. Braticevich. Prelude and Fugue in C sharp (Bach); Impromptu No. 1 (Chopin); Two Etudes (Chopin); The Musical Snuff-box (Liadov); Prelude (Scriabin); Seguidillas (Albéniz), Fire Dance (Falla). **1.30,** Exchange. **1.35,** Gramophone Concert. Rondo brillant (Weber); Entr'acte from Carmen (Bizet); Triana (Albéniz); March from Aida (Verdi); The Ride of the Valkyries from The Valkyrie (Wagner). **2.0,** Exchange. **3.45,** Exchange and Market Prices. **6.20,** Agricultural Report. **6.45,** Film Review. **7.0,** Book Review. **7.20,** Gramophone Music. Pierrot galant (Chillemont); Broadway Melody (Brown); Un chien qui rapporte (Borchard); Waltz Medley (Berlin). **7.45,** News and Agricultural Talk. **8.0,** The Tales of Hoffman—Operetta (Offenbach). In the intervals, News, Weather, Press Review and Review by Paul Reboux.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.,** Musical Originalities, from **New York.** **7.30,** KDKA Home Forum. **8.0 to 9.30, New York** Relay. **8.0,** Radio Guild. **9.0,** Betty and Bob. **9.15,** Rhythmic Serenade. **9.30,** Business News and Markets. **9.45,** Words and Music, from **New York.** **10.0,** Uncle Tom and Betty. **10.15,** KDKA Kiddies' Klub. **10.30,** The Singing Lady, from **New York.** **10.45,** Orphan Annie, from **New York.** **11.0,** News Reeler, by Pat Haley. **11.15,** Sports Notes and Programme Preview. **11.30,** Evensong. **11.45 to 12.45 a.m. (Tuesday), New York** Relay. **11.45,** Lowell Thomas. **12 Midnight,** Amos 'n' Andy. **12.15,** Baby Rose Marie. **12.30,** Potash and Perlmutter. **12.45,** What would you do? **1.0,** Variety Programme, from **New York.** **1.30,** The Silver Toppers. **1.45 to 3.30, New York** Relay. **1.45,** Red Davis. **2.0,** Sinclair Minstrels. **2.30,** Melody Moments. **3.0,** Popular Programme.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** Concert by Rudolf Stvan and his Orchestra: March (Aust); Waltz, Tesoro mio (Becucci); Selection from Pell-Mell (Navacek); Venetian Song, La Gondaliera (Zamrzla); Song, In olden times (Simacek); Polka, Young Widow (Vasica); Trumpet Duet (Pilat); Polka, Golden-Haired Girl (Vacker); Missouri Waltz (Logan); March (Pehlik). **3.50,** Programme for Children. **4.5,** See **Brno.** **4.15,** Gramophone Records. **4.35,** Elementary English Lesson. **4.50,** Gramophone Music. **5.5,** Agricultural Programme. **5.15,** Talk for Workers. **5.25,** News in German. **5.30,** German Transmission: Talk. **6.0,** Time, News, and Weather. **6.10,** See **Moravska-Ostrava.** **6.55,** See **Bratislava.** **9.0,** Time, News, Review of the Day, and Sports Notes. **9.15,** News in German and Film Notes. **9.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres, 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**). Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Lausanne**), Gramophone Concert. **12 Noon** (from **Lausanne**). Financial Notes. **12.10 p.m.** (from **Lausanne**), Gramophone Concert (contd.). **1.0,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0,** See **Schweizerischer Landessender.** **5.0** (from **Lausanne**), Talk on Metallurgy. **5.30** (from **Lausanne**), Programme for Children. **5.55** (from **Lausanne**), Italian Lesson. **6.20** (from **Lausanne**), Talk: A Visit to Lapland. **6.45** (from **Lausanne**), Notes on the Broadcasts for Schools. **6.59** (from **Lausanne**), Weather Report. **7.0** (from **Lausanne**), Humorous Programme. **7.15** (from **Lausanne**), Introductory Talk to the following Transmission. **7.30** (from **Lausanne**), Symphony Concert. In the interval at **8.30** (approx.), News and Weather. **9.30** (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**9.0 p.m.,** Time Signal followed by Popular Concert by the Radio Quartet. **9.30,** Reading. **10.0,** News. **10.30,** Petroushka—Ballet (Stravinsky) on Gramophone Records.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.**; and **2RO, 11,810 kc/s, 25.4 metres.**—**12.0 to 1.15 p.m.,** Gramophone Concert of Opera and Variety Music. In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.55,** Giornale Radio and Exchange. **4.10,** Weather. **4.15,** Song and Pianoforte Recital by Alba Anzellotti (Soprano) and Niccolo Chilf (Pianoforte), relayed from the Royal Philharmonic Academy. **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Dopolavoro Notes and Tourist Report. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time and Announcements. **7.15,** Songs by Elena Cheli (Soprano). **7.30,** Giornale Radio and sports Notes. **7.45,** Concert of Light Music, conducted by Culotta. In the interval: Sports Notes and Humorous Talk. **10.0** (approx.), Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.**—**7.30 p.m.,** Revolving Stage, from **New York.** **8.0,** Health Hunters, Sketch. **8.15 to 8.30** (approx.), Soloist, from **New York.** **12.45 a.m. (Tuesday),** Stock Reports. **1.0 p.m.,** News of the Day; Poetry; Historical Notes. **1.30 to 4.0, New York** Relay. **1.30,** String Symphony. **2.0,** A. and P. Gypsies. **2.30,** Del Monte Ship of Joy. **3.0,** Contented Programme. **3.30,** K-7, Secret Service Spy Story. **4.0,** Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres, 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.,** Gymnastics. **11.0** (from **Basle**), Gramophone Music. **11.29,** Time Signal from Neuchâtel Observatory. Weather, and News. **11.40** (from **Basle**), Light Music on Gramophone Records. **12.25 p.m.** (from **Basle**), Time, Weather and Exchange. **12.30** (approx.), Interval. **2.30** (from **Zürich**), Light Music. **2.59,** Time Signal from Neuchâtel Observatory. **3.0** (from **Basle**), Concert by the Kremo Orchestra. **5.0** (from **Basle**), Programme for Children. **5.30** (from **Zürich**), Talk: Laurenz Zellweger. **6.0,** Time and Weather. **6.5** (from **Zürich**), Overture, Tannhäuser (Wagner), on Gramophone Records. **6.20** (from **Zürich**), English Lesson. **6.50** (from **Zürich**), Concert by the Station Orchestra. **7.30** (from **Zürich**), Talk on Architecture. **8.0,** Weather and News. **8.10** (from **Zürich**), Concert of Eighteenth Century Music. **9.15** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**12.0 Noon to 12.30 p.m.,** Broadcast for Schools. **4.5,** Saxophone Solos and Variety Items. **4.50,** Gramophone Music. **5.50,** Talk in German: Swedish Literature in Germany, relayed from **Malmö, 1,301 kc/s, 230.6 metres.** **6.15,** Weather and News. **6.30,** Programme for the Seventy-fifth Birthday of Selma Lagerlöf: An Address; Rhapsody for Orchestra (Atterberg); Readings. **7.45,** Concert of Light Music by the Radio Orchestra. **8.45,** Weather and News. **9.0** (from **Göteborg**), The Practical Corner. **9.15,** Violin and Pianoforte Recital of Scandinavian Music: Cantas doloris (Sinding); Sonata (Monrad-Johansen). **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Light Music on Gramophone Records. **12.45 p.m.,** News. **1.0,** Time and Exchange. **1.5,** Variety Music on Gramophone Records. **2.0,** Interval. **5.0,** Orchestral Concert, conducted by Roskam: Overture, Czar and Carpenter (Lortzing); Three Pieces (Duchêne): (a) Intimité, (b) Jeunesse, (c) Sol-si; Selection from La Navarraise (Massenet); Two Songs (Schumann): (a) Der Abendstern, (b) Song; Suite variée (Pierné); Waltz, Fleurs et papillons (Witz); March, Apollo (Gauwin). **6.0,** Film Review. **6.15,** Review of the Week. **6.30,** Orchestral Concert, conducted by Roskam: Two Step, L'étoile de Valancia (Stauch); Waltz, La rose bleue (Aubry); Hiawatha's Lullaby (Donaldson and Young); Potpourri of Popular Songs (Bose); Tango from Countess Maritza (Kálmán); Slow Waltz, Petite princesse (Silesius); Mattinata (Leoncavallo); Foxtrot, Old Back Road (Hupfeld); Fantasia, Quand on est trois (Szule); Just a Little Home for the Old Folks (Leslie and Ahlert); Tango, Le destin (Gardal); One Step, Papa! Papa! (Yvain). **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German, Lottery Results and Announcements. **8.20,** Introductory Talk to the following Relay. **8.30,** L'enfance du Christ—Oratorio (Berlioz), by the Cathedral Choir, Municipal Orchestra and Soloists. Conductor: Hoch. In an interval at **9.30** (approx.), Press Review. **10.30** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**11.0 a.m.,** Concert by the Station Orchestra, conducted by Otto Seyfert. Overture, Gipsy Love (Lehár); Selection from Schön ist die Welt (Lehár); Spanish Waltz (Translateur); Habanera (Chabrier); Catalan Rhapsody (Ailbout); Le pas des fleurs (Delibes); Spanish Legend (Rust). **12.15 p.m.,** See **Frankfurt.** **12.25,** Local News and Weather. **12.35 to 1.30,** See **Frankfurt.** **2.0,** Talk on Flowers. **2.30,** Talk: The German Islands and Coasts. **3.0,** See **Langenberg.** **5.0,** French Lesson. **5.20,** Talk: Discoveries in the Land of the Incas. **5.35,** Talk on Astronomy. **5.50,** Time, Agricultural Notes and Weather. **6.0,** Transmission for all German Stations. The German Folk Song—Concert by the Station Orchestra and Choir, a Children's Choir and Soloists. **7.0,** See **Frankfurt.** **7.10 to 9.0,** See **Langenberg.** **9.0,** See **Frankfurt.** **9.20,** Things you should know. **9.30,** Local News, Weather, and Sports Notes. **9.40,** See **Langenberg.** **10.0,** See **Berlin (Deutschlandsender).** **10.10 to 12 Midnight,** See **Langenberg.** **12 Midnight,** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Music by an Argentine Band. **6.30,** Extracts from Operettas: Arias from Enlevez-moi (Gabaroche), Passionnément (Messager), La belle Hélène (Offenbach) and La Tulipe noire (Tiarke). **6.45,** Light Music. **7.0,** Songs. **7.15,** News. **7.30,** 'Cello Recital: Intermezzo from Goyescas (Granados); Gavotte (Lully); Agnus Dei (Bizet); La troyenne (Massenet). **7.45,** Orchestral Music: Dans l'éclat de la chandelle (Manfred); Selection from Les cent Vierges (Lecocq); Melody (Granichstaedten). **8.0,** Opera Music: Arias from The Pearl Fishers (Bizet), La basoche (Messager), Romeo and Juliet (Gounod) and Lakmé (Delibes). **8.15,** Military Music. **8.30,** Extracts from Sound Films. **8.45,** Accordion Solos. **9.0,** Concert by the Station Orchestra, conducted by Espy: Overture, Sigurd (Reyer); Waltz, Très jolie (Waldteufel); Selection from Les cloches de Corneville (Planquette); Entr'acte Music from La Colombe (Gounod); Selection from Manon (Massenet); Dance of the Sylphs and Hungarian March from The Damnation of Faust (Berlioz). In the interval, Songs from Operetta: Oh Papa (Yvain), Le grand Mogol (Audran), Véronique (Messager), and Elle est à vous (Yvain). **9.30,** Light Music and Concert (contd.). **10.15,** News. **10.30,** Concert for Listeners in Morocco. **11.0,** Chamber Music: Concerto in A Minor (Schumann); Concerto in B Flat (Tchaikovsky). **11.15,** Dance Music. **12 Midnight, News. 12.5 a.m. (Tuesday),** Opera Music: Susanna's Aria from Figaro (Mozart) and Wotan's Farewell from The Valkyrie (Wagner). **12.15,** Music by a Viennese Orchestra: Les millions d'Arlequin (Drigo); La valse brune (Krier); Parmi toutes les fleurs (Eblinger); Mon seul regret (Eblinger). **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 593 kc/s, 501.6 metres.**—**4.10 p.m.,** Concert of Variety Music. **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Dopolavoro Report and Gramophone Music. **6.0,** Time, Tourist Report and Gramophone Music. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** Time, Giornale Radio and Weather. **7.15,** Concert. **8.15,** Dramatic Programme. **8.45,** Concert of Chamber Music; Paola Della Torre (Soprano) and Massimo Amfitheatrof (Pianoforte). **9.30,** Dance Music on Gramophone Records. **10.0,** Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5.969 kc/s, 50.25 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in Italian. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: Overture, Joseph (Méhul); Flute Solo, Albumblatt (Joachim Andersen); Waltz, Irrlichter (Kriss); Minuetto celebre (Scarlatti); Extase (Ganne); An Sie (Raff); Mazurka No. 1 (Chopin); Mendelssohn Fantasia (Curt). **12 Noon,** Time, Weather, and News. **12.10 p.m.,** Concert (contd.): Mödlinger Marsch (Wacek); In a Chinese Temple Garden (Ketelbey); Waltz, Burschenliebe (Bayer); Song, Sehnsucht (Benätzky); La Marche des Commis Voyageurs (Sambin); Rêverie d'amour (Schmeling); Song, Der Steffel feiert Geburtstag (Roll); Potpourri, Ernst und Scherz für Wiener Herz (Komzak). **1.0 to 2.0,** Interval. **2.0,** Time, Weather, and Exchange. **2.20,** Talk: The Austrian Chemical Industry. **2.35,** Talk for Young People. **3.0,** Gramophone Records of Opera Music. **3.40,** Gymnastics for Children. **4.0,** Talk: The Chorus in Opera. **4.25,** Song and Pianoforte Recital by Karla Karl (Contralto) and Anatol Rappaport: Gavotte with Variations (Rameau); Intermezzo in A Minor (Brahms); La Campenella (Liszt-Busoni); Etude (Stravinsky); Suggestion diabolique (Prokoflev); Six Songs (Schubert): (a) Der Tod und das Mädchen, (b) Der Wanderer an den Mond, (c) Seligkeit, (d) So lass mich scheinen, (e) An Sylvia, (f) Lied im Grünen. **5.5,** Talk: Advertisement, Old and New. **5.15,** Talk: The Exhibition in Commemoration of the Painter, Ludwig Ferdinand Graf. **5.25,** Talk: Books in connection with the Week's Talks. **5.30,** Elementary English Lesson. **6.0,** Talk: The Seventy-fifth Anniversary of the Singverein of the Gesellschaft der Musikfreunde. **6.25,** Time, Weather, and Programme Announcements. **6.35,** Military Band Concert, conducted by Rösch: Sangesbrüder-Marsch (Richter); Waltz, Grubenlichter (Zeller); Rakoczy Overture (Keler-Bela); Karlsschüler Marsch (Weinberger); Torch Dance (Meyerbeer); Potpourri of Marches (Komzak); Khevenhüller Marsch (Friedrich); Waltz (Waldteufel); March, Die Vierer kommen (Richter). **7.45,** Topical Talk. **8.0,** Symphony Concert by the Wiener Symphoniker and the Trio Italiano: Alfredo Casella, Alberto Poltronieri (Violin), and Arturo Bonucci ('Cello). Conductor: Oswald Kabasta. Symphony in C, No. 97 (Haydn); Scarlattiana—Divertimento from Music by Scarlatti for Pianoforte and Orchestra (Alfredo Casella); Pianoforte Concerto, Op. 56 (Alfredo Casella); Symphonic Poem, L'apprenti sorcier (Dukas). In an interval at **8.45,** News. **9.35,** Announcements. **9.45,** Gramophone Records of Dance Music, by Jack Hylton and his Band.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5,** Popular Music on Gramophone Records. **11.30,** Radio Journal. **11.35,** Weather. **11.38,** Gramophone Music. **12 Noon,** Interval. **2.30 p.m.,** Economic Notes. **2.40,** Tourist Report. **2.45,** Aviation Notes and Anti-Gas Drill. **2.55,** Orchestral Concert: Potpourri of Waltzes (Robrecht); Romance (Denza); Polish Dance (Scharwenka); Extase (Ganne); Habanera; Czardas No. 8 (Michaelis); Aria from Eugene Onegin (Tchaikovsky); Leggenda d'amore (Becce); Melody (Denza); Pianoforte and Violin: Souvenir (Drdla); Waltz-Intermezzo: Reve des fleurs (Drdla). **3.40,** Elementary French Lesson. **3.55,** Concert of Russian Chamber Music by the Warsaw Quartet: Quartet No. 2 in D (Borodin); Quartet in A Minor, Op. 64 (Glazunov). **4.50,** Agricultural Correspondence. **5.0,** Talk. **5.20,** Military Programme. **5.45,** Choral Music and Songs on Gramophone Records. **6.0,** Programme Announcements. **6.5,** Miscellaneous Items. **6.25,** Reading: An Unknown Letter of Chopin. **6.40,** Sports Notes. **6.47,** Radio Journal. **7.0,** The Land of Smiles—Operetta in Three Acts (Lehár). **9.15,** Dance Music from the Oaza Café. In the interval at **10.0,** Weather and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

TUESDAY
NOVEMBER THE TWENTY-FIRST

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report, and Gramophone Concert. **6.0,** Programme for Children. **6.40,** News. **7.0,** Gaelic Reading. **7.15,** Val Vousden, Entertainer. **7.30,** Time Signal. **7.31,** Concert by the Station Orchestra. **8.0,** Mezzo-Soprano Solos by Gertrude Mortimer. **8.15,** Birds of a Feather—a Play, by the Emer Comedy Company. **8.45,** Baritone Solos, by T. Dawson. **9.0,** Talk: Items of Interest for Potato-Growers. **9.15,** The Station Orchestra. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert: Love Tales (Ager); Twenty Million People (Johnson); Let Bygones be bygones (Gilbert); My Love Song (Burnaby). **9.45,** Dance Music: I want to go home (Sanders); Shuffle off to Buffalo (Dubin); I can't remember (Berlin); Aint cha got Music? (Razaf). **10.0,** Concert arranged by the I.B.C. (Ireland), Ltd.: The Cuckoo Waltz (Jonasson); The Wedding of the Rose (Jessel); Xylophone Solo: Dance of the Marionettes (Gaston); Racing Commentary. Love's Dream after the Ball (Czibulka); Xylophone Solo: Crazy Pirouette (Frisk); Selection from Wonder Bar (Katscher); Wee Macgregor Petrol (Amers). **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** Round Tower Ceilidhe Band. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert. Selection from Lohengrin (Wagner); Cradle Song (Rimsky-Korsakov); Adoration (Filipucci); Selection from La Bohème (Puccini); Pavane (d'Ambrosio); Shepherd's Song (Elgar); Military March, No. 3 (Schubert). **7.0,** Request Gramophone Records. **7.30,** Exchange and Talk in Catalan. **8.0,** Gramophone Music and News. **8.30,** Catalan Educational Programme: Geography and History Lessons. **9.0,** Chimes, Weather, Programme dedicated to Seamen, Exchange and Market Prices. **9.5,** Sponsored Concert. **9.30,** Music by the Radio Orchestra. **10.0,** Concert by the Philharmonic Mandoline Orchestra. **11.0 to 11.15** (approx.), Dance Music by the Sobré Band, relayed from the Casa Llibre. **12 Midnight,** Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30 p.m., Quintet Concert. **3.55** (approx.) to **7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—**6.0 p.m.,** Aria Recital by Vladeta Popovic: Arias from Eugene Onegin (Tchaikovsky); The Bartered Bride (Smetana); The Fair at Sorotchinsk (Mussorgsky); Martha (Flotow); and Cavalleria rusticana (Mascagni). **6.30,** Talk. **7.0,** Concert by the Station Orchestra. **7.30,** Song Recital by Milan Timotic. **8.0,** Duet Recital by Milica Bosnjakovic and Bosko Nikolic. **9.10,** Time and News. **9.15** (approx.), Cigány Music, relayed from the Dva Jelena Restaurant. **9.50,** Dance Music on Gramophone Records.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**11.5 a.m.** (approx.), Gramophone Concert: Air from the Suite in D (Bach); Quartet in D, The Lark (Haydn); Moment musical in F minor (Schubert); Impromptu in B (Schubert); Quartet from Fidelio (Beethoven); The Egmont Overture (Beethoven); The Hebrides (Mendelssohn). **11.55,** Time Signal. **12 Noon to 12.45 p.m.,** Interval. **12.45,** News. **1.0,** Gramophone Concert: Lamond (Pianoforte): (a) Caprice in B minor (Brahms), (b) Concert Etude in D flat (Liszt). Helge Roswaenge (Tenor): (a) Flower Song from Carmen (Bizet), (b) Song from Cavalleria rusticana (Mascagni); Thibaud (Violin): (a) Minstrels (Debussy), (b) Sicilienne (Paradies). Willi Domgraf-Fassbaender (Baritone): (a) Star of Eve (Wagner), (b) Aria from Lohengrin (Wagner). Walter Gieseking (Pianoforte): Suite bergamasque (Debussy). Lotte Lehmann (Soprano): (a) Der Nussbaum (Schumann), (b) Aufträge (Schumann). **2.0,** Talk for Women. **2.30,** Weather and Exchange. **2.45,** Klaus Richter reads from his own Works. **3.0,** Concert from **Heilsberg. 4.0,** Technical Talk for Young People. **4.30,** Recital of Folk Songs by the Berlin Choir: Four Love Songs: (a) Feinslieb, Du hast mich gefangen (Hassler), (b) Allerschönster Engel (Scharwenka), (c) Herzeleid (Silcher), (d) Die Nachtigall im Tannenwald (Schumann). Three Humorous Songs: (a) Kuckuck (Lemlin), (b) Das schlaue Mädchen (Othegaven), (c) Die Leineweber (Othegaven). Three Serious Songs: (a) Ave verum corpus (Mozart), (b) In stiller Nacht (Brahms), (c) Im Walde (Schumann). **5.0,** Poems. **5.5,** Dialogue: The Necessity of Sacrifice. **5.25,** Political Press Review. **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Langenberg. 7.0,** Talk: Plebiscite and Economic Policy. **7.10,** Concert of German Chamber Music by Students of the Academy of Music: String Quartet in D (Haydn). Three Tenor Solos (Schubert): (a) Jüngling an der Quelle, (b) Stimme der Liebe, (c) Wanderer an den Mond; Duet for Violin and Viola (Mozart); Four Gipsy Songs for Vocal Quartet, Op. 112 (Brahms); Serenade for Flute, Violin and Viola (Beethoven); Two Polonaises for Pianoforte Duet (Schubert). **8.0,** Concert from **Leipzig. 9.0,** Weather and News. **9.30,** Talk: Future Arrangements for the Six Days' Racing. **9.45,** Weather. **10.0,** Concert from **Hamburg. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—3.30 p.m.,** Concert by the Waldemar Hass Orchestra: Overture, Prometheus (Beethoven); Waltz, Marienklänge (Jos. Strauss); Brise de mer (Leoncavallo); Selection from La Traviata (Verdi); Erinnerung (Lubbe); Serenade, Il bacio (de Micheli); Waltz, Paysage d'automne (Waldteufel). **4.30,** Coincidences, Premonitions, and Superstitions—a Discussion between a Doctor, a Sceptic, and a Psychic Individual. **5.10,** A Family at the Microphone. **5.30,** The Funkstunde informs its Listeners . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Langenberg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** Lottery Announcement. **7.15,** Concert of German Chamber Music. **8.0,** Medea—Musical Melodrama (Georg Benda). **9.0,** News. **9.20** (approx.), See **Hamburg. 11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News and Racing Results. **7.40,** Programme for Women. **7.55,** Lottery Results. **8.0,** Talk. **8.15,** News. **8.30,** See **Paris (Eiffel Tower).**

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—**4.50 p.m.,** Concert of Schrammel Music. **5.30,** Talk: The Castle of Bratislava. **5.40,** Lesson in Telegraphy. **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.30,** See **Moravská-Ostrava. 7.20,** Choral Concert of Hebrew Melodies. Soloists: Kijevsky and Frankl (Songs), and Penc ('Cello). **8.25,** See **Prague. 9.15,** Gramophone Music. **10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 485 kc/s, 253.1 metres.—1.10 p.m.,** Gramophone Concert of Dances. **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Market Prices. **2.20,** Listen, Everybody! **2.35,** Programme for Children. **3.0,** Concert from the Admiralspalast. **4.30,** Market Prices. **4.35** (approx.), Reading: Letters of and about Bismarck. **5.0,** Talk: Questions of Theology. **5.20,** Topical Talk. **5.40,** Programme Announcements and Meat Market Prices. **6.0,** Transmission for all German Stations, relayed from **Langenberg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** The Oldest Prussian Glass Works are to be opened again—a Radio Report from Kaiserswalde. **7.30,** Talk: German Chamber Music. **7.45,** Chamber Music. **9.0,** Time and News. **9.25,** Political Press Review. **9.45,** Pianoforte Trio in E flat, Op. 100 (Schubert). **10.25,** Gramophone Concert of Instrumental Music. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Janota: Polonaise from Boris Godunov (Mussorgsky); Ballet Music from The Demon (Rubinstein); Two Scandinavian Melodies for Strings (Svendsen); Suite, Op. 93 (Dvorak). **3.55,** See **Prague. 4.15,** Chess Lesson. **4.35,** See **Prague. 4.50,** Gramophone Music. **5.0,** Talk on Music. **5.15,** Broadcast for Workers. **5.25,** German Transmission: News, Talk, Agricultural Notes, and Legal Talk. **6.0,** See **Prague. 6.30,** See **Moravská-Ostrava. 7.20,** See **Prague. 7.45,** Gramophone Music. **7.55,** Concert by the Moravian Quartet and Soloists, relayed from the Masaryk University. **8.45,** Reading. **9.0,** See **Prague. 9.15,** Esperanto Programme, with Musical Items. **10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Pianoforte Recital by Alice Zinjé. Two Intermezzi (Brahms); Ballad (Brahms); Oudine (Ravel); Appassionato Jongen). **1.30,** Flowers in Music—Gramophone Concert. **5.0,** Concert by the Radio Orchestra, conducted by Walpot. Interlude (Dame); Oriental Suite (Armandola); Le Sommeil d'Endymion (Dame); Versailles (Guillaume); Bacchanale (Dvorak). **5.30,** Programme for Children. **6.5,** Literary Review. **6.15,** Impressions de Music-Hall (Picrné), on Gramophone Records. **6.30,** Léon Delcroix Concert by the Yvonne Vanhaecke (Song); Alice Delcroix-Cholet (Violin), Jean De Nocker ('Cello), and the Composer (Pianoforte); Two Songs: (a) Les Filandières, (b) Légende, Trio for Violin, 'Cello and Pianoforte; Two Songs: (a) Angelus, (b) Kermesse. **7.0,** Lecture Recital: Bizet's Opera, The Pearl Fishers. **7.15,** Weekly Review. **7.30,** Review for Women, followed by Notes on Art. **8.0,** The Pearl Fishers—Opera (Bizet)—Concert Version. **8.45** (in the interval), Talk. **9.45,** Request Gramophone Records. **9.55,** Christus Vincit (Liszt). **10.0** (approx.), Close Down.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Gramophone Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert. **5.0,** Concert by the Station Symphony Orchestra, conducted by Kumps: Overture, The Hebrides (Mendelssohn); Der Erlkönig (Schubert); Waltz from Der Rosenkavalier (R. Strauss); Gramophone Records: (a) Berceuse de Jocelyn (Godard), (b) Melody (Jensen); Dance of the Priestesses and Bacchanal from Samson and Delilah (Saint-Saëns); Prelude and Cortège from Déjanire (Saint-Saëns). **5.45,** Programme for Children. **6.30,** Extracts from La Vie parisienne (Offenbach) on Gramophone Records. **7.15,** Talk. **7.30,** Tourist Report. **8.0,** Concert by the Radio Orchestra, conducted by Walpot: Soloist: Henk Didama (Tenor); Melody (Eisler); Festival Overture (Lortzing); Selection from Tip Toes (Gershwin); Songs: (a) Ein Lied aus meiner Heimat (Jurmann), (b) Neapolitan Song (Curtis), (c) Melody from Der Lachende. Ehemann (Eysler), (d) Pecche (Pennino); Selection from Le chemin du Paradis (Heymann); Fortissimo (Kálmán); Offenbachiana (Conradi); Air from Countess Maritza (Kálmán); Gipsy Melodies (Borganov); Air from The Land of Smiles (Lehár); Viennese Operetta Potpourri (Hruby). In the interval, Talk: Author's Rights and Royalties. **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert of Variety Music by the Sibiceano Orchestra. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Song Recital by Sylvie Tiron: Arias from Tosca (Puccini), Tannhäuser (Wagner), and Madame Butterfly (Puccini). **7.20,** Symphony Concert by the Station Orchestra, conducted by Georgescо. In the interval at **8.0,** Talk. **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **7.30 p.m.** till Close Down.—**4.0 p.m.,** Concert by the Nandor Sovanka Cigány Band. **4.50,** French Lesson. **5.20,** Pianoforte Recital by Ladislaus Gergely. **6.0,** Talk. **6.30,** Military Band Concert, conducted by Friesay. **7.30,** The Two Letters —One-Act Comedy (Scribe). **8.25,** News. **8.40,** Talk by Bela Bartok, with Gramophone Illustrations: The Influence of Hungarian Folk Songs on the Music of the Neighbouring Countries. **9.30,** Weather. **9.35,** Concert by the Opera House Orchestra, conducted by Fridl: Overture, Alessandro Stradella (Flotow); Suite from Louise (Charpentier); Ballet Music from Faust (Gounod); Valse triste (Sibelius); Hungarian Dances Nos. 1 and 2 (Brahms).

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres** and **Skamlebaek OXY.—11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.2,** Concert by the A. Bendix String Ensemble, relayed from the Wivex Restaurant. **1.0 p.m.,** Interval. **1.30,** Readings in Dialect. **2.0,** Concert by the Radio Orchestra, conducted by Launy Gröndahl. Soloist: Olga Möller (Songs): March of the Marionettes (Gounod); Extracts from the Orchestral Suite No. 2 (Masscnet); Selection from Brylluрet paa Ulfsbjerg (Söderman); Hungarian Children's Suite (Dohnányi); Four Songs (Heise); Overture, Deux vieilles gardes (Delibes); Andante cantabile for Strings (Riis-Magnussen); Waltz, La coquette (Ingstrup); Ständchen (R. Strauss); Paraphrase on Hungarian National Tunes (Padouk); March from The Dollar Princess (Fall). **4.0,** Programme for Children. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk. **5.15,** Elementary German Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk. **7.0,** Time Signal from the Town Hall. **7.1,** Concert of South Jutland Songs by the Hvalsö School Choir. **7.20,** The Day Before the Monsoon—Radio Play (Geno Ohlischlaeger). **7.55,** Violin Solos by Mogens Hansen: Valse caprice (Wieniawski); Poème d'extase (Szymanovski). **8.10,** Music from Sound Films on Gramophone Records. **8.20,** A Visit with the Microphone to a Hospital. **8.50,** News. **9.5,** Concert of French Music by the Radio Orchestra, conducted by Emil Reesen: Extracts from the Petite Suite (Debussy); Three Extracts from Histories (Ibert); Selection from Masques et bergamasques (Fauré); Pavane pour une enfante défunte (Ravel); Golliwog's Cake Walk from The Children's Corner (Debussy). **9.55,** Dance Music by the Jens Warny Band, relayed from the Nimb Restaurant. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**10.30 a.m.** till **12 Noon,** Programme in English by the I.B.C. **10.30,** Concert: Signature Tune, It beats, as it sweeps as it cleans; Sentimental Gentleman from Georgia (Perkins); Lou'siana Lullaby (Newman); Selection of Marching Songs; Ding, Dong, Ding (Hargreaves); Old Music Hall Memories; Egypt (Wallace); Limehouse Blues; You're getting to be a Habit with me (Dubin); Signature Tune. **11.0,** Happy Hour; Part I. Military Music: Signature Tune, L'entente cordiale (Allier); Praeludium (Järnefeldt); Cornet Solo, Il bacio (Arditi); Selection from The Miracle (Humperdinck); Valse triste (Sibelius); Policeman's Holiday (Ewing); Sussex by the Sea (Ward Higgs); The Doges' March from the Merchant of Venice Suite (Rosse); Part II, Dance Music: Whistling under the Moon; What a Perfect Combination; Have you had a Good Day To-day? Sweetheart Darlin'; Somebody stole my Gal; For Love Time; Experiment; Goofus; Signature Tune. **12 Noon,** Programme in French. **3.30 to 6.0 p.m.,** Programme in English by the I.B.C. **3.30,** Accordion Band Music: Waltz, Petite Mimi (Baptiste); Accordion Joe (Cornell); Valse à la reine (Alexander); Dinah (Ahlert); Annett (Cuvelier); Tango Serenade (Stolz); Marche joyeuse (Cuvelier); C'est vous (Künnecke). **4.0,** Orchestral Concert: March of the Russian Hussars (Traditional); Stephanie Gavotte (Czibulka); Violin Solo, The Pibroch (Gouleseo); Black Eyes (Ferraris); Pan and the Wood Goblins (Rathke); Boublitonka (Traditional); Heartaches (Klenner); Dreams on the Ocean (Gungl). **4.30,** The I.B.C. Nursery Corner with Columbus and Belinda: Birthday Greetings, Trumpets. **4.40,** Torquay and Exeter Concert of Light Music: Signature Tune, The Night by the Sea; Russian Rhapsody (Nussbaum); Xylophone Solo, Fiddlesticks (Robbins); Waltz from Der Rosenkavalier (R. Strauss); When the Lilac blooms again (Rotter); Waltz from Bitter Sweet (Coward); In a Cloister Garden (Morgan); Monsieur Tricotrin (Rawlingson); Deep Water (Heymann); The Huntsman (Nelson); Ninon (Moretti). **5.20,** Plymouth and Devonport Concert of Military Music; Down South (Myddleton); In a Clock Store (Orth); Selection from The Miracle (Humperdinck); Cornet Solo, The Lost Chord (Sullivan); The Doges' March (Rosse); On the Quarter Deck (Alford); Song, Richard of Taunton Deane (arr. Molloy). **5.45,** Concert of Dance Music: If you'll say Yes, Chérie; The Wedding of Mr. Mickey Mouse; Moths around the Candle Flame; Goodnight Little Girl of my Dreams. **6.0,** Programme in French. **10.0** (approx.) till Close Down, Programme in English by the I.B.C. **10.0,** Tango Band: Toujours, toujours (Manilla); Si, Si (Remy); Donde estas Corazon (Berto); Conchita (Paolito); Nina (Paolito); Zigeuner, you have stolen my Heart (arr. Egen); For you, just you my Baby (Rotter); Mon amour (Paolito); I've told Every Little Star (Hammerstein); Sweetheart Darlin' (Kahn); If I had Someone to love (Hill); Sundown in a Little Green Hollow (Whiting); Cecilia Mia (Frontela); It's the Talk of the Town (Symes); Dancing Butterfly (Young); Little Romany (Leon). **11.0,** Talkie Time, Tunes from the Talkies and Shows: Signature Tune, Sittin' in the Dark; Hold your Man (Freed); One Alone, from The Desert Song (Romberg); Why has a cow got four legs? Selection from The Crooner; Dancing on the Ceiling (Evergreen); One Little Drink (Akst); There's Something about a Soldier (Gay); Come out, Vienna (Joh. Strauss); Signature Tune. **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd: Signature Tune, Come back to Erin; Selection from Grieg's Works (Urbach); Harlequin's Serenade (Leoncavallo); St. Patrick's Day (arr. Brase); Cavatina (Raff); Song, The Two Grenadiers (Schumann); To the Spring (Grieg); Waltz from Coppélia (Delibes); General Mulcahy (Brasse); Signature Tune, Come back to Erin. **12.5 a.m. (Wednesday),** Late News Bulletin in English. **12.10** (approx.), Club Concert for Leamington Listeners: Signature Tune, The Chum Song; Don't blame me (Fields); Si, Si (Remy); Gipsy Sing for me (Pola); Reflections in the Water (Webster); Moths around the Candle Flame (Randal). **12.30,** Dance Music: Sing Another Line;

Trouble in Paradise; Hold your man; Egypt; Lazybones; Wedding of the Dragon Flies; It's Sunday down in Caroline; Sweet Dreams Pretty Lady; Carry me back to Green, Green Pastures; Signature Tune. **1.0,** Hawaiian Music: Song of the Island (King); Isle of Paradise (Earl); Maria Mari (di Capua); Honolulu Bay (Earl); That Little Lock of Hair (Verrill); Hula Hula (Lever); Lonely Little Vagabond (Scely); Reef of Stars (Watts). **1.30,** Light Music: Gems of Robbie Burns; Oh! I wish I could sing a Love Song; The Old Folk at Home; My Sunshine is you; Hittin' the Bottle; Song, Love me To-night; Night aboard the Saucy Sue; The Kiss Waltz. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—11.0 a.m.,** Gramophone Concert. **12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** Orchestral Concert, conducted by Gustav Schumacher. Soloists: Käthe Klare Kickhefel (Contralto) and Otto Braun (Pianoforte). Overture, La Favorita (Donizetti); Symphonic Poem, Die Wolfs-Schlucht (Gauwin); Gavotte and Minuet (Heller); Songs (Otto Braun); Scènes de Chasse (Fauchey); Scheherazade (Schmalstich); Fahrend Volk (Leuschner). **1.40,** Talk for the Housewife. **2.30,** Sports and Weather. **2.40,** Time and Exchange. **3.0, Langenberg-Frankfurt-Stuttgart** Exchange Programme—Concert. Part 1: **Langenberg** Programme. Part 2: Chamber Music on Old Instruments: Sonata for 'Cello and Harpischord (Marcello); Suite for Recorder and Harpsichord (Fischer); Sonata for Viola da Gamba and Harpsichord (Schenk); Suite for Flute, Viola da Gamba and Harpsichord (Telemann); Arias with 'Cello Obbligato; Duets for two Recorders (Chédeville); Trio Sonata for Violin, Viola da Gamba and Harpsichord (Buxtehude). Part 3: **Stuttgart** Programme. **5.0,** Italian Lesson. **5.20,** Talk: The Black and Yellow Races as Competitors of White Workers in America. **5.35,** Talk: Puppet and Marionette Plays. **5.50,** News and Time Signal. **6.0,** Transmission for all German Stations, relayed from **Langenberg. 7.0,** See **Berlin (Deutschlandsender). 7.10 to 9.0,** See **Stuttgart. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News and Weather. **9.45 to 11.0,** See **Stuttgart. 11.0** (also on **Zeesen, 31.38 metres),** German Mysticism: Reading from Der mystische Quell (Meister Melchior Lechten). **11.45** (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres,** and **Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m.,** Transmission for all German Stations, relayed from **Langenberg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** Concert of German Chamber Music by the Small Station Orchestra, conducted by Gerhard Maasz, a Choir and Soloists. **9.0,** News. **9.20,** Concert by the Station Orchestra, conducted by Adolf Secker: Tetuan from the Moorish Rhapsody (Humperdinck); Suite from Mona Lisa (Schillings-Secker); Der Eremit from the Böcklin Suite (Woyrsch); A Festival in Bagdad (Rimsky-Korsakov); Air and Rigaudon for Strings (Grieg); Italian Serenade (Wolf); Vasantasena Suite (Halvorsen); March and Ballet Music from Aïda (Verdi); Waltz from Der Rosenkavalier (Richard Strauss).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW.—Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert of Variety Music. In the intervals at **12.20** and **1.0,** News. **1.30,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices and Exchange. **2.30,** Programme for Children. **3.0,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. In an interval at **4.0,** Talk: What can Women do for the Fatherland? **4.40,** Book Review. **5.0,** Talk: Sport from the Point of View of the Boatmaker. **5.15,** Agricultural Prices. **5.25,** Pianoforte Sonata in A Flat, Op. 110 (Beethoven), by Joachim Ansorge. **5.50,** Weather, relayed from **Langenberg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** Concert by the Women's Choir, conducted by Paul Firchow. Soloists: Franz Schiffmann (Violin), and Ernst Rudolph (Pianoforte). Violin and Pianoforte Sonatina, in D Op. 167 (Schubert); Ständchen for Contralto, Choir and Pianoforte (Schubert); Choir: Two Pieces (Rohlov): (a) Vorspruch, (b) Mutterliebe; Pianoforte Solo: Aus den Hausmärchen (Haas); Choir: (a) Wiegenlied (Haas), (b) Freund Husch (Haas); Violin and Pianoforte: Sonata in G (Haydn). **8.10,** Hermann Sundermann Memorial Programme for the Fifth Anniversary of the Writer's Death. Talk and Readings. **8.40,** Songs to the Lute by Ursula and Wulfhild Milthaler. **9.0,** News.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to **5.40 p.m.** and 20 kW. from **5.40 p.m.**—Programme of the General Broadcasting Society (A.V.R.O.). **12.10 p.m.,** Concert by the Wireless Orchestra, conducted by Nico Treep: Overture, Martha (Flotow); Selection from Mirella (Gounod); In the Sudan (Sebek); Gramophone Music; Serenade (Drigo); Play of the Butterflies (Heykens); Elfin Serenade (Rayners); Dance of the Marionettes (Gillet); Selection from Paganini (Lehár); Gramophone Music; Waldteufelreigen (Weninger); Paraphrase on the Song La Paloma (Mannfred); Champagne Gallop (Lumbye). **1.55,** Interval. **2.10,** Orchestral Concert (contd.).: First Hungarian Rhapsody (Liszt); A Musical Snuff Box (Liadov); Ballet Music from Lakmé (Delibes); Overture, Cagliostro in Wien (Joh. Strauss). **2.40,** Dressmaking Lesson. **3.40,** Violin and Pianoforte Recital by Stanislas Frydberg and Sophie Loopuit Roeper; Variations on a Theme of Corelli (Tartini-Kreisler); Air from the Suite in D (Bach-Wilhelmi); Præludium and Allegro (Paganini-Kreisler); Nocturne, Op. 27 (Chopin-Wilhemi); Song (Kirman-Dushkin); The Prisoner (Gretchaninov-Frydberg); Perpetuum mobile (Ries). **4.10,** Concert by a Children's Choir, conducted by Jacob Hamel. **4.40,** Programme for Children. **5.10,** Talk. **5.40,** Concert by the Wireless Orchestra, conducted by Nico Treep. **6.40,** Talk: The Formation of Words. **6.55,** Gramophone Music. **7.10,** English Lesson. **7.40,** Time and News. **7.45,** Concert of Light Music by Kovacs Lajos and his Orchestra. **8.40,** Cæsar and Cleopatra—Play (Bernard Shaw), translated by Vogt. **9.50,** Concert of Light Music by Kovacs Lajos and his Orchestra. In the interval, Radio Report by an Eye Witness of the Six Days' Racing at Amsterdam. **10.40,** News. **10.50,** Gramophone Concert with Radio Report (contd.). **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.—11.55 a.m.** till **7.40 p.m.,** Programme of the Catholic Radio Society (K.R.O.). **11.55,** Concert by the K.R.O. Orchestra, conducted by Gerritsen: Radetzky March (Joh. Strauss); Overture, Der Wildschütz (Lortzing); Selection from Czar and Carpenter (Lortzing); Waltz, The Blue Danube (Joh. Strauss); Suite, The Three Bears (Coates); Selection from La Mascotte (Andran); Gramophone Music; Overture, Carnival in Rome (Strauss); Two Norwegian Dances (Grieg); La fille aux cheveux de lin (Debussy); Waltz Op. 54 (Dvorak); Polka, Tritsch-Tratsch (Strauss). **1.40,** Programme for Children. **2.40,** Dressmaking Lesson. **3.40,** H.I.R.O. Programme. **4.50,** Concert by the K.R.O. Boys, conducted by Lustenhouwer; Marching along together (Steininger); La bella Tangolita (Abraham); Moonlight on the Riveria (Gilbert); Spanish Serenade (Welser); Im Walzerrausch (Lincke); Joey the Clown (Reaves); Selection from The Bird Fancier (Zeller); Einmal kommt einer (Guttmann); Ein Jeder hat mal Glück (Schulenburg); Dornröschens Brautfahrt (Rhode); Wie ein Märchen von Glück (Holms); Uns kann keiner (Heymann); Im Schwarzwald geht ein Mühlenrad (Rust); The London Fire Brigade (Towers). In an interval at **5.40,** Talk. **6.20,** Esperanto Lesson. **6.40,** Police Notes. **6.55,** Talk for Mothers. **7.15,** Gramophone Music. **7.25,** Talk. **7.40** till Close Down, Programme of the Christian Radio Society (N.C.R.V.). **7.40,** Concert by the Bennebroek Choir. **8.40,** Talk for Parents. **9.10,** Concert by the Jubal Orchestra, conducted by Schotel. **10.10,** Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.,** News. **12.35,** See **Frankfurt. 1.30,** Talk: The Winter Relief Fund. **1.45,** 'Cello and Pianoforte Recital by Robert Grote and Hans Haass. 'Cello and Pianoforte: Albumblatt (Grodtzki). Pianoforte Solo: Shepherd and Shepherdess (Godard). 'Cello and Pianoforte: Romance (Huber). **2.0,** By-Products of Coal—A visit to a Laboratory. **2.30,** Market Prices. **2.50,** Political Announcements. **3.0, Langenberg, Frankfurt** and **Stuttgart** Exchange Programme. Part 1, Concert of Chamber Music. Talk: Music Teaching for Children. Sonatina in D for Pianoforte and Violin (Schubert); Two Scottish Folk Songs for Soprano (Haydn); Minuet from the Pianoforte Quartet in F minor, Op. 6 (Prince Louis Ferdinand); Sonatina for Two Violins (Mozart); Waltzes for Pianoforte Duet, Op. 39, Nos. 11 and 15 (Brahms); Sonata for Viola and Pianoforte (Eccles); Music Notes. Part II, **Frankfurt** Programme. Part III, **Stuttgart** Programme. **5.0 to 5.35,** See **Frankfurt. 5.35,** Talk: German Chamber Music. **5.50,** Announcements. **6.0,** Transmission for all German Stations. Chamber Music by Contemporary West German Composers. The Station Orchestra, conducted by Buschkötter, the Station Choir, conducted by Breuer, a string Trio and Soloists: Festival Music (Bettingen). Choir: Lieder der Treue (Erpf); Five Tone Pieces for Pianoforte (Weber); String Trio in E minor, Op. 14, No. 1 (Schröder); Piece for Orchestra (Maler); Landsknechtslied (Gerster). **7.0,** See **Berlin (Deutschlandsender). 7.10 to 9.0,** See **Stuttgart. 9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News and Sports Report. **9.45 to 11.0,** See **Stuttgart. 11.0,** See **Frankfurt. 11.45** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—12.30 p.m.,** The Bachs and the Mozarts at Home—Recital with Introductory Talk. Part 1, Bach. Pieces from Ann Magdalena Bach's Music Books: (a) Prelude, Fugue, Sarabande and Gavotte from the Partita in E minor, (b) Schlummert ein ihr matter Augen, (c) Willst du dein Herz mir schenken; Prelude in C from Das wohltemperirte Klavier. Part II, Mozart: Suite No. 7 in D; Suite No. 9. **1.15,** News. **1.30,** Talk on Chamber Music. **1.40,** Programme to be announced. **2.0 to 2.15,** Pianoforte Duets by Theodor Blumer and Friedbert Sammler. **2.35,** Market Prices. **3.0,** Chamber Music by the Gewandhaus Quartet. Ernst Hoenisch (Violin) and Theodor Blumer (Pianoforte): String Quartet, Op. 76, No. 2 (Haydn); Sonata in D, Op. 12, No. 1, for Violin and Pianoforte; Quintet in G minor for Two Violins, Two Violas and 'Cello (Mozart). **4.0,** Musical Anecdotes. **4.20,** Recital of Children's Songs. **4.40** (from **Dresden**), Violin Duets and Songs by Gustav Fritzsehe, Fritz Schneider and Christine Drechsler: Allegro moderatio in G and Andante in C from Duetten, Op. 117 (Sitt). Songs: (a) Der liebliche Stern (Schubert), (b) Wiegenlied (Schubert), (c) Mond, meiner Seele Liebling (Schumann), (d) Viel Glück zur Reise, Schwalben! (Schuman); Duet No. 2 in A (Ries). Songs (Reger): (a) Meinem Kinde, Op. 43, No. 3, (b) Mädchenlied, Op. 51, No. 5. **5.10,** Instrumental Concert. Walter Götze (Guitar), Ferdinand Kollmaneck (Zither), Bruno Graichen (Bandonion) and Rudolf Smole (Mandoline). Mandoline Solos: (a) Concert Mazurka (Munier), (b) Meine kleine Mandoline (Smole), (c) Campanella (Büttner). Bandonion Solos: (a) Libelle (Pörschmann), (b) Kirchweih (Seifert), (c) Polka (Pörschmann). Guitar Solos: (a) Barcarolle (Rosté), (b) Minuet (Giuliani). Zither Solos: (a) Ave Maria (Huber), (b) Frohe Gedanken (Kollmaneck). **5.40,** Market Prices and To-day's News. **6.0,** Transmission for all German Stations, relayed from **Langenberg. 7.0,** See **Berlin (Deutschlandsender). 7.10,** An Evening in Vienna with Schubert—A Literary and Musical Radio Picture. **9.0,** News and Sports Notes. **9.20,** See **Hamburg. 11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.,** Programme for Children. **5.30,** Gramophone Music. **6.0,** French Lesson. **6.30,** Educational Talk. **7.0,** Programme of Waltz Music. **7.30,** Songs. **8.0,** Vocal Duets. **8.30,** Weather and News. **8.50,** Concert by the Station Orchestra. **9.30 to 10.0,** Programme in English by the I.B.C. Club Concert: The Village Band (Edgar); Coming round the Mountain; My Donna Rita; Flower of Spain; The Count of Luxembourg; Come along with me; Bon Voyage. **10.0** (approx.), Close Down.

LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW.—Belgian Evening. **7.0 p.m.,** Symphony in D minor (Franck), on Gramophone Records. **7.45,** Concert of Opera and Operetta Music by the Radio Orchestra, conducted by Henri Pensis. Soloist: Edouard Lichtenstein (Tenor). **8.50,** News in French. **9.0,** Concert of Belgian Music. Soloist: Edmond Perbal (Violin). Four Pieces (Dupuis); Violin Concerto No. 4 (Vieuxtemps); Page nostalgique (De Sutter); Boxe (Schoemaker); Russian Dance (De Taeye). **9.50,** News in German. **10.0,** Potpourri, Melodious Memories (Finck), on Gramophone Records. **10.15,** Dance Music on Gramophone Records.

MADRID

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.40,** Light Music. **12 Midnight till 12.30 a.m. (Wednesday),** I.B.C. Concert. Hawaiian Sunset; Please; There's a Flower in my Ranch; All through the Night; The Blue Danube; Mama Inés; Once I fell in Love; Now I am in Love. **12.30 a.m.,** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Topical Talk and Dance Music. **7.30,** Talk by Joaquin España Cantos and Request Gramophone Music. **8.15,** Radio Journal. **8.30 to 9.15,** Interval. **9.15,** English Lesson. **9.30,** Chimes, Time and Radio Journal. **9.45** (approx.), Dona Francisquita—Musical Comedy (Vives). **11.45,** Radio Journal. **12.0 Midnight,** Chimes. **1.0 a.m. (Wednesday)** till Close Down, I.B.C. Programme of Dance Music. Louisville Lady; Isn't this a Night for Love; A Woman should stick to her Man; With you here and me here; It's not a Secret any More; I called to say Good-night; Twixt the Devil and the Deep Blue Sea; You're an Old Smoothie; Whistling under the Moon; Peter, Peter; Ding, Dong, Ding; Trouble in Paradise; One Tiny Tear; Hold your Man; I lay me down to Sleep; I'll take an option on you. **2.0,** I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**6.30 p.m.,** Cabaret Programme. **7.20,** Schrammel Ensemble Concert. **7.45,** See **Prague. 9.15,** Gramophone Concert. **10.0** (approx.), Close Down.

MOSCOW

KOMINTERN, RW1, 202.5 kc/s, 1,481 metres; 500 kW.—**3.30 p.m.,** Educational Talk: Feudalism. **4.30,** Red Army Programme. **5.30,** Collective Farms' Programme. **6.30,** Report on the Construction of the Moskva-Volga Canal. **7.0,** Concert by Weltmann ('Cello) and a Domra Sextet. In the interval, Literary Items. **8.0,** Talk in German: The Importance of the Far East. **8.55,** Chimes from the Red Square. **9.5,** Talk in French: The Soviet Union. **10.5,** Talk in Dutch: The Importance of the Far East.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.,** Orchestral Concert. **4.45,** We build a house—Radio Picture (Walter Kühne Hellmessen). **5.5,** In Praise of Chamber Music—A Radio Sequence. **5.25,** Reading: The Life and Destiny of our earliest ancestors (Georg Walter Suppin). **5.45,** Time, Weather and Market Prices. **6.0,** Transmission for all German Stations relayed from **Langenberg. 7.0,** See **Berlin (Deutschlandsender). 7.15** (from **Nürnberg**), Talk. **7.45,** Chamber Music. **8.30,** Reading of Poems. **8.40,** Songs by the Station Choir. **9.0,** Time and News.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 477.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy, LCL, 6,990 kc/s, 42.82 metres.—4.0 p.m.,** Concert, relayed from the Lyche Restaurant. **5.0,** Programme for Housewives. **5.45,** Hawaiian Guitar Music. **6.0,** Weather and News. **6.30,** English Lesson. **7.0,** Time Signal. **7.1,** Concert by the Station Orchestra, conducted by Kramm. Cavalry March (R. Strauss); Overture Le Cheval de Bronze (Auber); Ballet Music from Kassya (Delibes); Waltz (Kern); Melody (Bull); Scene and Waltz from Gretna Green (Guirand); Romance (Neuport); French Serenade (Grieg): Selection from The Dubarry (Millöcker-Maekehen). **8.10,** Literary Review. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Divertissement in D for Orchestra and Two Horns (Mozart), relayed from **Bergen, 824 kc/s, 364 metres. 9.50** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Report, Agricultural Notes and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Il Trovatore—Opera in Four Acts (Verdi), on Gramophone Records. In the intervals, Talk: Past, Present and Future, and Announcements. After the Opera, Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.**

NOV. 21st TUESDAY *continued*

NOV. 21st TUESDAY *continued*

(Preliminary and 6-dot Signals).—**5.45 p.m.**, Le Journal Parlé. **7.15**, Weather. **7.25**, News. **7.30**, Light Music on Gramophone Records. **7.45**, Art Notes. **8.0**, Science Talk. **8.15**, Political Review. **8.30**, The Prophet—Opera in Five Acts (Meyerbeer), relayed from the Conservatoire.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.**, Gramophone Records. **7.15**, Le Journal Parlé. **7.30**, Sponsored Gramophone Concert. **8.0**, Legal Talk. **8.5**, Film Review. **8.35**, Orchestral Concert, conducted by Théodre Mathieu. Ballet Music from Sylvia (Delibes); Ballet de cour (Pierné); Mother Goose Suite (Ravel); Ballet Music from Bal costumé (Rubinstein); La petite elfe ferme l'oeil (Florent Schmitt); Ballet Music from Les deux pigeons (Messager). **10.45**, News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.**, Physical Culture. **7.30**, Weather and Physical Culture (contd.). **7.45**, Gramophone Music. **8.0**, Press Review and Weather. **12 Noon**, Gramophone Concert: Credo d'amour (d'Ancourt); La Précieuse (Couperin-Kreisler); Le Martin pêcheur (Gerard); La Fille aux cheveux de lin (Debussy); Tristesse (Geraldy); La Leggierezza (Liszt); Le Village (Fremine); Spanish Serenade (Glazunov). **12.30**, Concert by the Henri Poussigne Orchestra. In the interval at **1.0**, Exchange, News and Weather. **1.30**, Gramophone Concert (contd.): La Ronda (La Torre); Musette (Leojac-Flouron); Mayon (Ledoux); Poupées de Paris (Loyraux); Ma bien aimée; La fontaine de Caraouet (Letorey); Vous dansez, Marquise (Lemaire); Tweet-tweet (Leslie Sarony). **2.0**, Exchange and Announcements. **4.30**, Elementary English Lesson. **6.20**, Agricultural Talk. **6.40**, German Lesson. **7.0**, Art Notes. **7.20**, Gramophone Music (Saint-Saëns); Le solitaire; Le pas d'arme du Roi Jean; La Cloche. **7.30**, Organ Music: Fantasia in C Minor (Bach);; Fugue in G Minor (Bach); Choral No. 3 in A Minor (Cesar Franck); Sonata No. 6 (Mendelssohn); Prelude in E (Saint-Saëns). **7.45**, Review of the Anglo-Saxon Press. **8.0**, Divertissement sur des Chansons russes (Rabaud), on Gramophone Records. **8.30**, The Prophet—Opera in Five Acts (Meyerbeer), relayed from the Conservatoire. In the intervals, News, Sports Notes and Review by Pierre Scize.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.**, Four Aces. **7.15**, Musical Originalities, from **New York.** **7.30**, KDKA Home Forum. **8.0**, Rochester Orchestra, from **New York.** **9.0**, Betty and Bob. **9.15**, Congress of Clubs. **9.30**, News and Markets. **9.45**, Brown Palace Orchestra, from **New York.** **10.15**, KDKA Kiddies' Klub. **10.30**, The Singing Lady, from **New York.** **10.45**, Orphan Annie, from **New York.** **11.0**, News by Pat Haley. **11.15**, Sports Notes and Programme Preview. **11.30**, Evensong. **11.45**, Lowell Thomas, from **New York.** **12 Midnight**, Amos 'n' Andy, from **New York.** **12.15 a.m. (Wednesday)**, Marvellous Melodies. **12.30**, Lois Miller, Organist. **12.45**, Programme to be announced. **1.0 to 2.30. New York** Relay. **1.0**, Crime Clues. **1.30**, Adventures in Health. **1.45**, Trade and Mark. **2.0**, Musical Memories. **2.30**, Programme to be announced. **3.0**, Ortiz Tirado, from **New York.**

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.**, See **Brno.** **3.55**, Programme for Young People—Celebration of Latvian Independence Day. **4.15**, Topical Talk for Workers. **4.25**, Gramophone Music. **4.35**, German Conversation Lesson. **4.50**, Gramophone Music. **5.5**, Agricultural Priees. **5.15**, Topical Talk for Workers. **5.25**, News in German. **5.30**, German Transmission—Talk: Education and Democracy. **6.0**, Time, News and Weather. **6.10**, Talk: The Changing World. **6.30**, See **Moravska-Ostrava.** **7.20**, Talk with Gramophone Illustrations: Indian Folk Music. **7.45**, Tsar Saltán—Recitation of Pushkin's Words, with Gramophone Records of Rimsky Korsakov's Music. **8.25**, Lecture Recital: The Development of the Pianoforte Sonata. Sonata in G, Op. 49, No. 2 (Beethoven); Sonata in F minor, Op. 2, No. 1 (Beethoven). **9.0**, Time, News, Review of the Day and Sports Notes. **9.15**, See **Brno.** **10.0** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW., and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28**, Time Signal from Neuchâtel Observatory. **11.30**, News and Weather. **11.40** (from **Lausanne**), Gramophone Concert. **12 Noon** (from **Lausanne**), Financial Notes. **12.10** (from **Lausanne**), Gramophone Concert (contd.). **1.0 p.m.**, Interval. **2.58**, Time Signal from Neuchâtel Observatory. **3.0** (from **Lausanne**), Concert by the Radio-Lausanne Orchestra, conducted by Moser: Symphony No. 3 for String Orchestra (Ph. E. Bach); Quartet No. 3, Op. 74 (Haydn); Four Slovak Dances (Felber); Lullaby (Sgambati); Serenade (Sgambati); Gipsy Overture (Ketelbey); Melody (Franck); Krakoviak (Czajanek); Meditation (Coleridge-Taylor); Polonaise (Cui). After the Concert, Light Music. **5.0** (from **Lausanne**), Programme for Women. **5.30** (from **Lausanne**), Literary Review. **5.55** (from **Lausanne**), German Lesson. **6.20** (from **Lausanne**), Talk. **6.45** (from **Lausanne**), Reading. **6.59** (from **Lausanne**), Weather Report. **7.0** (from **Lausanne**), On a mis le feu—Drama in Three Acts (Guy Berger). **9.0**, News and Weather. **9.15** (from **Lausanne**), Dance Music. **10.0** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.30 p.m.** (approx.), and **2RO, 11,810 kc/s, 25.4 metres.**—**12 Noon to 1.15 p.m.**, Trio Concert from **Turin.** In the intervals from **12.30 to 12.45**, Giornale Radio and Exchange, and at **1.0**, Time and Announcements. **3.30**, Children's Radio Review. **3.55**, Giornale Radio and Exchange. **4.10**, Weather. **4.15 to 5.0**, Orchestral Concert. Quando la donna vuole (Waldam-Chiappo); Adagetto amoroso (Brancucci); May Song (Dax); Intermezzo slavo (Culotta-Korch); Selection from Loreley (Catalani); Quando (Caslar); Fantasia of Old Songs (Bideri); Melody (Jurmann). **5.40 (Naples)**, Shipping and Sports Notes. **5.45**, Atmospheric Signals and Dopolavoro Report. **6.0**, Tourist Report. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Giornale Radio. **7.0**, Time and Announcements. **7.15**, Request Gramophone Records. **7.30**, Tristan and Isolda—Opera in Three Acts (Wagner). Talk and News in the intervals. Giornale Radio after the Opera.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres**, and by **W2XAD** on **19.56 metres.**—**12.45 a.m. (Wednesday)**, Stock Reports. **1.0 to 3.45**, New York Relay. **1.0**, Popular Programme. **1.30**, Wayne King's Orchestra. **2.0**, Ben Bernie's Orchestra. **2.30**, Variety Programme. **3.0**, Lives at Stake. **3.30**, Madame Sylvia of Hollywood. **3.45**, Piano Pals and Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.**, Gymnastics. **11.0** (from **Zürich**), Programme for Housewives. **11.5** (from **Zürich**), Concert of Light Music. **11.29**, Time Signal from the Neuchâtel Observatory, Weather and News. **11.40** (from **Zürich**), Concert (contd.). **12.25 p.m.** (from **Zürich**), Time, Weather and Exchange. **12.30** (approx.), Interval. **2.30** (from **Zürich**), Concert by the Small Station Orchestra, conducted by Scherbaum. **2.59**, Time from Neuchâtel Observatory. **3.0**, See **Radio Suisse Romande.** **5.0** (from **Berne**), Gramophone Concert. **5.30** (from **Berne**), Programme for Young People. **6.0** (from **Berne**), Time, Weather and Announcements. **6.10** (from **Berne**), Talk. **6.20** (from **Berne**), Gramophone Music. **6.50** (from **Berne**), Talk on the Postal System. **7.20** (from **Berne**), Concert by the Municipal Orchestra, conducted by Jäggi. **8.0**, Weather and News. **8.10**, Concert by a Male Voice Choir. **8.40** (from **Berne**), Le Pélerin—Comedy in One Act (Vildrac). **9.40** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**1.45 to 2.10 p.m.**, Broadcast for Schools. **4.5** (from **Göteborg**), Programme for Children. **4.30**, A Microphone Report. **4.45**, Gramophone Music. **5.45**, Elementary French Lesson. **6.15**, Weather and News. **6.30**, Talk: The Court of Assizes, relayed from **Uppsala, 662 kc/s, 453.1 metres.** **7.0**, Concert by the Radio Orchestra, conducted by Tor Mann. Overture, Der Schanspieldirektor (Mozart); Pianoforte Concerto in D (Haydn); Suite (von Dittersdorf); Waltz, Tales from the Vienna Woods (Joh. Strauss). **8.15**, Talk: Horsemanship. **8.45**, Weather and News. **9.0**, Concert of Light Music by the Gallis Orchestra, relayed from **Malmö, 1,301 kc/s, 230.6 metres.** Overture, Tutti in maschera (Pedrotti); Songs (d'Ambrosio); Canzonetta (d'Ambrosio); Selection from Christopher Columbus (Franchettl); Serenade (Chantrier); Bimba mia (Coda); Rhapsody (Atterberg); Labbra coralline (Beccucci); Tango (de Bassi). **10.0**, (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.**, Light Music on Gramophone Records. **12 Noon**, Orchestral Concert, conducted by Maurice de Villers. In the interval at **12.45, p.m.**, News, and **1.0**, Exchange. **2.0**, Interval. **4.45**, Talk: Tourism in Tunisia. **5.0**, Variety Concert, conducted by Roskam: Two Step, Vizzavona (de Bozi); Waltz, Très jolie (Waldteufel); Just a Night for Meditation (Young-Pollack); String Quartet with 'Cello Obbligato: Enjôlement (Bilhaud); Tango, A mar del Plata (José); Isn't this a Night for Love (Burton and Jasons); Offenbach Potpourri (Conradi); Waltz, Around You (Whiting); Intermezzo from Der Weg zum Herzen (Lincke); You're telling me (Kahn and Donaldson); March, This is the Day of Days (Woods and Dixons). **6.0**, Talk: Vantan and the Fortifications of France. **6.15**, Topical Talk. **6.30**, Pianoforte and Song Recital of French Music by Mme. Strubbe-Catel and Mme. Juncker (Soprano). Pianoforte Solo: Lutins (Aubert). Soprano Solo: L'horizon chimérique (Fauré). Pianoforte Solo: Impressions (Paray). Soprano Solo: Esquisses (Grovlez). Pianoforte Solos: (a) Sarabande (Grovlez), (b) Croquis d'Orient (Huë), (c) Glissando (Moreau). **7.30**, Time and News. **7.45**, Gramophone Music. **8.0**, Press Review in German. Lottery Results and Announcements. **8.30**, See **Paris (Eiffel Tower).** **10.30** (approx.), Press Review.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.25 p.m.**, Local News and Weather. **12.35 to 1.30**, See **Frankfurt.** **1.30**, Talk on German Chamber Music. **2.0**, Concert of German Chamber Music with Commentary: The Württemberg Union of Music Performers and Teachers, and their Pupils; March for String Instruments (Bach); Three Pieces for Pianoforte Duet (Bruckner); Duet for Recorders (Mozart); Minuet for Violin, Viola, 'Cello and Lute (Haydn); Waltz for Pianoforte Duet (Pauer); Divertimento for Strings (Leopold Mozart); Concerto for Violin and Strings (Telemann); Songs with String Quartet Accompaniment (Adam Krieger); Zum Lob der Musik (Haas). **3.0** Langenberg-Frankfurt-Stuttgart Exchange Programme. Part I. **Langenberg** Programme; Part 2. **Frankfurt** Programme; Part 3. Folk Music for Accordion and Zither. **5.0 to 5.35**, See **Frankfurt.** **5.35**, Talk: Heinrich von Kleist. **5.50**, Time Announcements and Weather. **6.0**, Transmission for all German Stations relayed from **Langenberg.** **7.0**, See **Berlin (Deutschlandsender).** **7.10**, From the Cocoa Bean to the Bar of Chocolate—Radio Report (arr. Karl Köstlin). **8.0**, Concert of South German Music by the Municipal Wind Instrument Orchestra, conducted by Rudolf Hanker: Bayerischer Defiliermarsch (Scherzer); Waltz, Münchner Kindl (Komzak); March, Die lustigen Holzhackerbubn (Wagner); Bavarian Ländler; Tölzer Schützenmarsch (Kettner); North and South in Song and Dance (Rath). **9.0**, See **Frankfurt.** **9.20**, Things you should know. . . . **9.30**, Local News, Weather and Sports Notes. **9.45**, Gramophone Music. **10.0**, Humorous Programme on Gramophone Records (arr. Enderling). **11.0**, See **Frankfurt.** **11.45** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—**6.0 p.m.**, News. **6.15**, Chansonnettes. **6.30**, Music by an Argentine Band. **6.45**, Extracts from Sound-Films. **7.0**, Accordion Solos. **7.15**, News. **7.30**, Symphonic Poem, Les Préludes (Liszt). **7.45**, Songs. **8.0**, Operetta Music. **8.15**, Opera Music: Arias from Carmen (Bizet); Cavalleria rusticana (Mascagni), Thaïs (Massenet) and Werther (Massenet). **8.30**, Concert of Light Music by a Viennese Orchestra. **9.0**, Concert Version of The Damnation of Faust—Opera (Berlioz). **9.30**, Orchestral Music: Slav Dance (Dvorak); Wedding Waltz (Lincke); Prelude (Rachmaninov); Moonlit Glade (Ketelbey). **9.45**, Chansonnettes. **10.0**, Accordion Solos. **10.15**, News. **10.30**, Concert for Listeners in Morocco: Part I, Opera Music; Arias from: (a) The Magic Flute (Mozart), (b) Tannhäuser (Wagner), (c) Figaro (Mozart), and (d) Sigurd (Reyer). Part II. Orchestral Music: Serenata di Caci (Micheli); Aubade d'amour (Monti); Quand les chats sont partis (Raiter); Les fantoches (Raiter). **11.0**, Operetta Music: Arias from New Moon (Romberg), Le coeur y est (Parès and Van Parys), Azor (Gabaroche), and The Merry Widow (Lehár). **11.15**, Dance Music. **12 Midnight**, News. **12.5 a.m. (Wednesday)**, Extracts from Sound-Films. **12.15**, Military Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.**, Dance Music. **5.0 to 5.5**, Weather. **5.40**, Giornale Radio, Dopolavoro Report, and Gramophone Music. **6.0**, Time, Report of the Royal Geographical Society, and Gramophone Music. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Gramophone Music. **7.0**, News, Sports Notes, Weather and Gramophone Music. **7.30**, An Operetta in Three Acts. Talk and Notes on Art in the intervals. Giornale Radio after the Operetta.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.**, Religious Information in English. **7.0 to 7.15 p.m.**, Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.**, Concert by the Wiener Symphoniker conducted by Holzer. **12 Noon**, Time, Weather and Announcements. **12.10 p.m.**, Famous Artists on Gramophone Records. **2.0**, Time, Weather and Exchange. **2.20**, Programme for Children: Folk Music on Gramophone Records. **3.20**, Handwork for Children. **3.55**, Talk: Trees and Social Anthropology. **4.20**, Song and Violin Recital by Sophie Capek-Angermayer (Soprano) and Colette Frantz. Songs: (a) Wenn alle Welt so einig wäre (Reger). (b) Sag' es nicht, geliebtes Herrchen (Reger), (c) So ist die Liebe (Wolf), (d) All mein' Gedanken, mein Herz und mein Sinn (R. Strauss), (e) Du meines Herzens Krönelein (R. Strauss); Sonata for Violin and Pianoforte (Vivaldi); Violin Solos: (a) Romance in G, Op. 40 (Beethoven), (b) Havanaise (Saint-Saëns), (c) Moto perpetuo (Ries). **5.5**, Talk: Theophrastus Paracelsus, his Life and Personality. **5.30**, French Lesson for Beginners. **6.0**, Concert by the Wiener Symphoniker, conducted by Holzer, and the Vienna Schubert Society Quartet. Soloist: Karl Rosner (Violin). March, Alte Kameraden (Teike); Overture, A Waltz Dream (O. Straus); Violin Solo: Wiegenlied (Schubert); Quartet: (a) Tango (Erwin), (b) Intermezzo (Sarony); Waltz, Schön ist die Welt (Lehár); Millöcker Potpourri (Morena); Quartet: (a) Foxtrot (Nicholls), (b) Waltz (Wiga); March, Es lebe die Liebe (Kálmán); Overture, Gri-Gri (Lincke); Quartet: (a) Die Barke (Nöhrig), (b) March Foxtrot (Föderl); Waltz, Wild Roses (Ertl); Song, Maria (Arnold); Potpourri of Viennese Songs, Servus Wien (Dostal). In the interval at **6.35**, Time, Weather and Announcements. **7.30**, Von der Bauernschaft ewiger Kraft—Radio Sequence (Rendl). **8.45**, Talk in French: Austria in Winter. **8.55**, News, Weather and Exchange. **9.10**, Serenade, relayed from the Hotel Krantz-Ambassador. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.**, Time Signal and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5**, Orchestral Concert. Ballet Suite (Popy); Waltz, No. 4 (Lassota); Baci nel buio (Micheli); Waltz, No. 3 (Lassota); Ideale (Tosti); Tango (Wilkosz); Czardas (Monti); Waltz, Brise argentine (Daquin); Mazurka (Lewandowski); Mazurka (Namyslowski). **11.30**, Radio Journal. **11.35**, Weather. **11.38**, Concert (contd.). **12 Noon**, Interval. **2.30**, Economic Notes. **2.40**, French Music on Gramophone Records. Three Nocturnes (Debussy); Selection from Daphnis et Chloe (Ravel). **3.25**, Announcements. **3.40**, Polish Lesson. **3.55**, Concert by the Cyganeria Theatre Orchestra, conducted by Gorzynski. Soloist: Mankiewicz (Songs). Foxtrot (Sarony); Waltz and Polka (Eysler); Songs: Les marins (Hosson); La nuit (Kirschmann); Waltz from The Count of Luxembourg (Lehár); Songs: Mexican Dance (Sygietynski); Italian Serenade (Holmburg-Holmes); Foxtrot (Laszlo). **4.50**, Agricultural Notes. **5.0**, Talk. **5.20**, Musical Correspondence. **5.35**, Opera Music on Gramophone Records. **6.0**, Programme Announcements. **6.5**, Miscellaneous Items. **6.25**, Topical Talk. **6.40** Sports Notes. **6.47**, Radio Journal. **7.0**, Concert by the Station Symphony Orchestra, conducted by Wilkomirski. Soloists: Argasinska (Soprano), and Lewiecki (Pianoforte). Introductory Talk; Symphony in C Minor (Wilkomirski); Symphonic Variations (Werthcim); Songs (Szymanowski); Rozana's Aria from King Roger (Szymanowski); Pianoforte Concerto (Rozycki); Selection from the Ballet, The Fable (Rogowski). In the interval, Reading. **9.0**, Dance Music from the Gastronomia Café. In the interval at **10.0**, Weather and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

WEDNESDAY
NOVEMBER THE TWENTY-SECOND

ALGIERS

825 kc/s, 363.3 metres; 13 kW.—**7.10 p.m.,** Shipping Notes. **7.15,** Agricultural Report and Weather Forecast. **7.20,** Gramophone Records of Yvonne Printemps and Sacha Guitry. **7.55,** News. **8.0,** Time. **8.2,** Lottery Results. **8.10,** Symphony Concert, conducted by Henry Defosse. Symphony in B Minor, No. 8—The Unfinished (Schubert); Marche écossaise (Debussy). **8.40,** News. **8.45,** Gramophone Music. **8.55,** Symphony Concert (contd.) Intermezzo (Mussorgsky); Turkish March (Mussorgsky); Shylock (Fauré); Overture, Der Freischütz (Weber). **9.40,** News. **9.45,** Extracts from Boris Godunov (Mussorgsky) on Gramophone Records. **9.55,** News.

ATHLONE

726 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.**—**1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gaelic Talk. **7.15,** German Lesson. **7.30,** Time Signal. **7.31,** The Station Orchestra. **8.0,** Soprano Solos by Edie O'Dwyer. **8.15,** A Comedy by Aoife Taaffe and Company. **8.45,** The Station Orchestra. **9.0,** Talk by Padraic Gregory: The Catholic Heritage in English Literature. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Accordion Band Music: Signature Tune: Don't be late in the Morning (Le Clerq); Volante March (Baptiste); Accordion Duet: Lorentina Waltz (Macari); Swance (Gershwin); Bertina Waltz (Baptiste). **9.45,** Orchestral Concert: Amorettentanz (Gungl); The Bumble Bee's Wedding (Clare); Banjo Solo: Tattoo March (Grimshaw); Selection from The Desert Song (Romberg). **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd. Dance Music: The Grass is getting greener; Jam-a-lam-a do-do-do; Never too old; Moonstruck; Racing Commentary; My Moonlight Madonna; Are you sure you love me?; How are you?; Lullaby of the Leaves. **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** Irish Dance Music by the Round Tower Ceilidhe Band. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert. **7.0,** Request Gramophone Music. **7.30,** Exchange and Gramophone Music (contd.). **8.0,** Gramophone Music and News. **8.30,** Catalan Educational Programme: Geography and History Lessons. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5,** Concert by the Station Orchestra. **10.0,** La Ehmita, La Fuente y el Rio—Drama in Three Acts in Verse (Eduardo Marquina). **11.0** (in the interval), News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Children. **3.55** (approx.) **to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15,** See **Turin. 7.30** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—**6.0 p.m.,** Gramophone Music. **7.5,** Symphony Concert, relayed from **Prague. 9.0,** Time and News. **9.5** (approx.), Dance Music on Gramophone Records.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**11.0 a.m.,** Gramophone Concert of Classical Music. In an interval at **11.55,** Time Signal. **1.0 p.m.,** Programme for Young People. **2.0,** Organ Music on Gramophone. **2.45,** Lothar Schreyer reads from his own Works. **3.15,** Concert from **Stuttgart. 4.40,** String Quartet in F, Op. 135 (Beethoven), by the Brunier Quartet. **5.20,** Heimgang (The Home-coming)—Radio Sequence (Ernst Keienburg). **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** To-day's Motto. **7.2** (approx.), The German Passion, 1933—Radio Play in Six Scenes (Richard Euringer), with Incidental Music by Herbert Windt. **8.10,** See **Munich. 9.0,** News. **9.45,** Weather. **10.0,** See **Munich. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.**—**3.0 p.m.,** Concert by the Station Choir and Soloists; Conductor, Heinzkarl Weigel. **4.20,** Six Songs by Gellert, Op. 48 (Beethoven), by Karl-Oskar Dittmer (Baritone). **4.40,** Sonata in C (Handel) for 'Cello and Pianoforte, by Julius Berger and Prudentia Olbrich. **5.0,** A Radio Fable. **5.30,** Reading (Paula Modersohn). **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.5,** Die Ueberwältigten (The Vanquished)—A Radio Sequence for the Day of Atonement (Fritz Dehn). **8.10,** Credo and Sanctus from the Mass in B minor (Bach), relayed from the Philharmonie; The Berlin Philharmonie Orchestra and the Choir of the Singakademie, conducted by Georg Schumann; Soloists, Charlotte Boerner (Soprano), Ida Barth zur Nieden (Contralto), Max Meili (Tenor), Albert Fischer (Bass), and Fritz Heitmann (Organ). **9.0,** News. **9.15** (approx.), Light Music on Gramophone Records. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News. **7.40,** Dramatic Criticisms. **7.55,** Lottery Results. **8.0,** Agricultural Talk. **8.15,** News. **8.30,** Gramophone Music. **9.0,** Light Orchestral Concert.

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Kornel Schimpel. Overture, No. 2 (Blodek); Suite, The Taming of the Shrew (Zilcher); Two Pieces for Strings, Dawn and Elegy (Jindrich); Waltzes Nos. 2 and 5 (Dvorak); Scherzo (Lalo). **3.50,** Play for Children. **4.20,** Talk for Children. **4.35,** Gramophone Music. **4.55,** Hungarian Transmission: Recitations, followed by Pianoforte Recital: Suite of Old Dance Melodies, Op. 14 (Bartok); Hungarian Folk Songs (Weiner). **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.40,** See **Brno. 7.0,** See **Prague. 9.15** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**11.0 a.m.,** Concert by the Silesian Philharmonic Orchestra, conducted by Rischka: Overture, Egmont (Beethoven); Good Friday Magic from Parsifal (Wagner); Andante from the Fourth Symphony (Schubert); Music from Sigurd Jorsalfar (Grieg); Beethoven Overture (Lassen); Serenade in D minor (Volkmann); The Swan of Tuonela (Sibelius); An das Vaterland (Rischka). **1.0 p.m.,** News. **2.35,** Talk: The Racial Origins and Characteristics of the People of Silesia. **3.0,** Concert by the Station Orchestra, conducted by Prade: Music from Abdelazer (Purcell); Violin and Orchestra, Adagio (Mozart); Divertimento No. 17 (Mozart). In an interval at **3.45,** Reading: Der Traum vom Himmel (Jean Paul). **5.0** (from **Gleiwitz**), Silesian Stories. **5.20,** Pianoforte Trio in C, Op. 87 (Brahms), on Gramophone Records. **5.45,** Programme Announcements. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** News. **7.10,** Concert by the Station Orchestra, conducted by Rischka: Overture, Iphigenia in Aulis (Gluck); Trio in C minor, Op. 1, No. 3 (Beethoven); Two Elegies (Niemann); Violin Solo; Postludium (Rischka). **8.15,** Folk Song Recital by Käthe Heilbig (Soprano), Herbert Heidrich (Tenor), and the Station Orchestra, conducted by Ernst Prade. **9.0,** Time and News. **9.30,** Military Band Concert, relayed from **London. 10.15,** Harmonium Recital by Hans Wesemann. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News, Talk: The Psychological Defects in Education, Broadcast for Workers and Legal Talk. **6.0,** See **Prague. 6.40,** Song Recital by Marta Halirová and Dolezal. **7.0** till Close Down, See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Lecmans: Overture, The Black Domino (Auber); Waltz from The Chocolate Soldier (O. Straus); Spanish Fantasia, Per le vie di Siviglia (Lattuada); Selection from Le roi d'ys (Lalo); Violin Solo: Foxtrot (Chaumont); Three Dances from Nell Gwynn (German); Boite à musique et Pianola (Antiga); Selection from Rigoletto (Verdi). **1.0 p.m.,** Le Journal Parlé. **1.10,** Orchestral Concert, conducted by André Felleman, relayed from the Grand Hotel, Antwerp. Soloist: Arthur Maebe (Violin); Don't be late in the Morning (Leclerq-Mendoza); Slav Rhapsody (Friedemann); Serenade, Il bacio (de Micheli); Violin Solo: Aria (Bach); Selection from Marietta (O. Straus); March, Sambre et Meuse (Turina). **5.0,** Concert by the Chas Remue Orchestra and the Tango Juan Thibo Orchestra, relayed from the Plaza. **6.0,** Talk: Victor Vreuls, a Belgian Musician. **6.15,** Gramophone Concert: Légende (de Maleingreau); Two Pieces (Bernier): (a) Miroir, (b) Le blé est blond; Humoresque (Jongen); Chevauchée à l'aube (Brenta). **6.30,** Violin and Pianoforte Recital by Emile Chaumont and Thérèse Chaumont: Chaconne (Vidal); Sonata (Handel); Sonata (Buffin). **7.10,** Gramophone Music: Ballet Suite (Handel-Beecham); Scherzo from Romeo and Juliet (Berlioz); Overture, La farce du envier (Dupont). **7.30,** Medical Talk. **8.0,** Gramophone Music: March from Prince Igor (Borodin); Suite, Four Ways (Coates). **8.20,** La Botte couronnée—Flemish Comedy in Five Acts (Michel de Swaen), translated by Henri Vergriete. **9.30,** Concert by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp. **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW.—Programme in Flemish. **12 Noon,** Orchestral Concert, relayed from the Grand Hotel, Antwerp: Extracts from Sissy (Kreisler); The Blue Danube (Joh. Strauss); Serenade (Heykens); Potpourri, Round Belgium in Thirty Minutes (Deuliez). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: Overture to an Operetta (Lincke); Waltz from Eva (Lehár); The Clock and the Dresden Figures (Ketelbey); Selection from Madame l'Archiduc (Offenbach); Hungarian Rhapsody for 'Cello (Popper); Intermezzo (Kalkman); Fantasia on Franco-American Music (Salabert). **5.0,** Gramophone Concert: The Kitten on the Keys (Confrey); Melody (Bratton); Waltz, L'espace (Waldteufel); Da ich ein Kind war (Gresche r); You are my heart's delight (Lehár); Selection from Perlmutter (O. Straus); Waltz, A toi (Waldteufel); Was wär' mein Lied (Goetze). **5.30,** Concert by the Radio Orchestra, conducted by Franz André: Soloist: Paul Collaer (Pianoforte); Three Capriees (Milhaud); Extracts from Die Dreigroschenoper (Weill); Carnaval d'Aix (Milhaud). **6.15,** Talk: The Dutch East Indies and the Belgian Congo. **6.30,** Concert (contd.): Suite, La nuit (Sauguet); Concertino (Krenek); Cinq grimaces (Erik-Satie); Jack in the Box (Erik-Satie). **7.15,** Gramophone Records: Mattinata (Leoncavallo); Selection from Eldorado (Ruthland-Clapham); Künstlerleben (Joh. Strauss). **7.30,** Le Journal Parlé. **8.0,** Concert of Flemish Music by the Station Symphony Orchestra, conducted by Meulemans: Soloists: Stoefs (Flute) and Toutenel (Baritone); Feestklanken (Verheyden); Symphonic Poem for Flute and Orchestra (Benoit); Baritone Solo, with Orchestral Accompaniment: Trois chevaliers (Tinel); Dance from Le Songe d'une nuit d'hiver (De Boeck). **8.45,** Recitation. **9.0,** Concert (contd.): Overture, William of Orange (Van Hoof); Extracts from the Suite, James Ensor (Alpaerts); Im memoriam (Mortelmans); Serenade (Wactput); Three Songs: Extract from La Mer (Gilson). **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert by the Station Orchestra: March (Stelzig); Waltz, Ballgeflüster (Meyer-Hellmund); Carnival Overture (Dvorák); Selection from Thais (Massenet); Piece (Eilenberg); Grieg Potpourri (Urbach); Melody (Friml); Serenade (Amadei); Potpourri (Paschill). In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.40,** Talk. **7.0,** Pianoforte Recital by Titi Fotino: Gavotte (Gluck-Brahms); Rhapsody (Brahms); Berceuse (Chopin); Three Mazurkas (Chopin); Soirée de Vienne (Schubert-Liszt). **7.30,** Talk. **7.45,** Song Recital. **8.15,** Violin Recital. **8.45,** Radio Journal. **9.0,** Romanian Music by the Station Orchestra, conducted by Dinico.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **6.25 p.m.** till Close Down.—**3.0 p.m.,** Gramophone Concert. **4.40,** Talk. **5.10,** Quartet Concert. **6.0,** Italian Lesson. **6.30,** I Pagliacci—Opera (Leoncavallo) and Coppélia—Ballet (Delibes), relayed from the Royal Hungarian Opera House. In the interval, News. After the Programme, Concert by the Emil Roosz Orchestra, from the Café New York.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamblebaek OXY.**—**11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.15,** Broadcast for Schools. **11.45,** Concert by the Leonard Gyldmark Ensemble, relayed from the Bellevue Strandhotel. **1.0 p.m.,** Interval. **2.0,** Gramophone Concert of Light Music. **2.30,** Concert by the Radio Orchestra, conducted by Emil Reesen: Overture, La Cenerentola (Rossini); Waltz (Svendsen); Minuet (Boccherini); Selection from Die toten Augen (d'Albert); Ballet Music from Henry VIII (Saint-Saëns); Overture, Sovedrikken (Weyse); Two Extracts from the Suite, Aus Holbergs Zeit (Halvorsen); Valse des fleurs (Tchaikovsky); First Movement from the Serenade for Strings (Dvorák); Norwegian Dance in D minor (Grieg). In an interval at **3.15** (approx.), Programme for Women. **4.30,** Exchange and Fish Market Prices. **4.45,** Agricultural Talk. **5.15,** French Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk. **7.0,** Time Signal from the Town Hall. **7.1,** A Listeners' Meeting for the Election of the Radio Council, relayed from the State Broadcasting Building. In an interval at **9.0,** News. **10.15,** Dance Music by the Richard Johansen Dance Band, relayed from the Lodberg Restaurant. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I: Request Programme. Signature Tune; The Whistler and his Dog (Pryor); Over the Waves (Rosas); Tell me to-night; Dance of the Nymphs (Birch); La Source (Delibes); In the Gloaming (Chaminade); Who is Sylvia? (Schubert); Selection from The Belle of New York (Kerker); On the Quarter Deck (Alford). Part II: Light Music. I want to be happy (Youmans); Makin' faces at the Man in the Moon (Monaco); You didn't have to tell me; Beautiful Love; You got Love; The Clock Maker's Dream (Orth); C'est l'amour (Pierre); Thanks (Coslow); Selection, Give me a Ring. Signature Tune. **12 Noon,** Programme in French. **3.20 to 6.0,** Programme in English by the I.B.C. **3.30,** Light Music: Waltz from The Gipsy Princess (Kálmán); I kiss your lips (Rudolphe); Marching through Georgia (Work); Czardas (Monti); A Radio Roundabout (Noack); Song, Reflections in the water (Webster); In tulip time beside the water mill (Ailbout); Pride of the Wolferines (Sousa). **4.0,** Hawaiian Band Music: Naughty Hawaii (Carlo); La Rosita (Dupont); Aloha Oé (Kahn); Tango des Roses (Bottero); Dream Girl of yesterday (Hamper); Cara mia (Brodzsky); Hawaiian Love (Traditional); Southern Serenade (Norman). **4.30,** The I.B.C. Nursery Corner with Columbus and Belinda, Birthday Greetings; Trumpets. **4.40,** Concert of Choral Selections for Isle of Wight Listeners: Signature Tune, The Night by the Sea; Orchestra, My Hero (Straus); Love sends a little gift of Roses (Openshaw); Come where by love lies dreaming (Foster); The Hills of Home (Fox); Orchestra, I do like to be beside the seaside (Glove); Selection from Congress Dances (Heymann); Duet, A Paradise for Two (Fraser Simson); Orchestra: The Clock and the Dresden Figures (Ketelbey); Memories of Drury Lane; Orchestra: The Phantom Brigade (Myddleton). **5.20,** Orchestral Concert for Portsmouth and Southsea Listeners: Selection from The Yeoman of the Guard (Sullivan); Mignonette (Friml); Roses from the South (Strauss); Violin Solo, Indian Love Call (Friml); Autumn Leaves (Pepper); Souvenir de Capri (Becce); Pianoforte Solo from Viktoria and her Hussar (Abraham); Fairy on the Clock (Meyers); Pianoforte Solo: Just Humming along (Ewing); The Song of the Nightingale (Ailbout); The Capricious Musical Box (Fresco); Signature Tune. **6.0,** Programme in French. **10.0** till Close Down, Programme in English by the I.B.C. **10.0,** Light Music: Let's go Native; Song, Lay your head on my shoulder (Conrad); The Moon is low; Pianoforte Solo: The Birth of the Blues (Henderson); I lost my girl from Memphis; Song, Down in the Valley (Harrington); Under Heaven's Blue (Payan); Wiener Blut (Strauss). **10.30,** Dance Music: Signature Tune, The Bells of Normandy; Goodnight Little Girl of my Dreams; What a perfect Combination; My Moonlight Madonna; Oh, Johanna; Let's call it a Day; Moths around the candle flame; Rosa mia; Snowball. **11.0,** Talkie Time—Tunes from the Talkies and Shows: Signature Tune, Sittin' in the Dark; Love songs of the Nile (Freed); Learn to Croon (Coslow); There'll still be Love (Marvel); Pretty One (Joh. Strauss); In a year, in a day (Heymann); Selection from Il est charmant (Moretti); Komm Zigeuner (Kálmán); She's everybody's Sweetheart now (Hargreaves); Signature Tune. **11.30,** Club Concert for Birmingham Listeners: Signature Tune, The Chum Song; Her first dance (Heykens); Venetian Boatman's Song (Mantovani); Song, Roll up the carpet (Hoffmann); Waltz from A Waltz Dream (Straus); Moonbeam (Peter); Song, Widdicombe Fair (arr. Jacob); Little Yvonne (Schwartz); Tales from the Vienna Woods (Strauss). **12.5 a.m. (Thursday),** Late News Bulletin in English. **12.10** (approx.), Club Concert—Part 2: Look what you've done (Kálmán); Morning, Noon and Night (Swamstrom); Aloha Oe; Tonight; Sing another line (Carson); Signature Tune; From me to you (King); At the Old Pig and Whistle (Butler); Lover (Rodgers); Happy as the day is long (Koehler); Vilja's Song from The Merry Widow (Lehár); Passion Flower (Kennedy); Ev'ryone loves my Marguerite (Woods); Sentimental Gentleman from Georgia (Perkins). **1.0,** Dance Music: Signature Tune, The Bells of Normandy; Selection from Dinner at Eight; Nunca; Tick, Tock; Wood Violets; I've got to pass your house; Let the world go drifting by; Conchita; Lazy-

bones; Isn't this a night for Love; The Wedding of Mr. Mickey Mouse; Shadows on the Swanee; Reflections in the Water; The Last Round up; Mi Amor esta en el Valle; My Own; If you'll say Yes, Chérie; Signature Tune. **2.0,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Classical Music on Gramophone Records. **1.30,** Programme to be announced. **2.0,** See **Langenberg. 3.0,** See **Stuttgart. 5.0,** See **Langenberg. 5.30,** Talk: Family Responsibilities. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** Concert by the Station Orchestra, conducted by Rosbaud and Soloists. **7.40,** Talk: Pictures of German Towns—Worms. **8.20,** Concert (contd.). **9.0,** Time and News. **9.45** till Close Down, See **Stuttgart. 12.15 a.m. (Thursday),** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m.,** Fairy Music—Concert by the Small Station Orchestra, conducted by Gerhard Maass: Bärenhäuter-Marsch (S. Wagner); A Fairy Tale (Suk); Selection from Das Christelflein (Pfitzner); Legend No. 10 (Dvorák); Two Fairy Tales (Medtner); Selection from Hansel and Gretel (Humperdinck). **4.0,** Readings (Ruth Schauman and Robert Hohlbaum). **4.30** (from **Flensburg**), Organ Recital and Choral Music by Gertrud Trenktrog and the Flensburg Wanderkantorei: Organ Solos: Prelude and Fugue in E Flat (Bach); Motet for Three-Part Choir and Recorder: Cantate domino canticum novum (Buxtehude); Praeludium in D Minor (Pachelbel); Two-Part Choir: Die Nacht ist kommen (Gumpelzhaimer). **5.15,** Cili Cohrs—Dialect Play (Corch Fock). **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** Programme to be announced. **8.30,** Recital on Two Pianofortes by Willy Dohm and Albert Thaler; Duettino concertante on Themes of Mozart (Busoni); Rondo (Chopin); Waltz (Rachmaninov). **9.0,** Time and News. **9.20,** Concert by the Small Station Orchestra, conducted by Gerhard Maass: Overture, Alfonso und Estrella (Schubert); Andante from the Second Symphony (Beethoven); Bilder aus dem Osten (Schumann); Selection from Der Freischütz (Weber); Two Intermezzi (Brahms); Minuet in E Minor (Grieg); Prelude to Schirin und Gertraude (Graener); Two Old Dances (Lendvai): (a) Eros Thanatos, (b) Arkadia, ein Idyll; Aus einem alten Patrizierhause (Niemann); Variations from the Suite in Old Style (Halvorsen); Wiegenlied (Humperdinck); Nocturne (Borodin).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—11.0 a.m.,** Concert of German Music by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner: Soloist: Erwing Ross (Songs). **1.0 p.m.,** Interval. **2.0,** Practical Hints for Housewives. **2.10,** Programme for Children. **2.35,** Talk: The Woman as Protectress of the Race. **3.0,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken. **4.45,** Talk: Bird Sanctuaries in East Prussia. **5.0,** Talk on East Prussia. **5.30,** Reading. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0** (from **Danzig**), Der Strom (The Stream)—Radio Play (Max Halbe). **8.20,** Sacred Concert by the Station Choir, conducted by Paul Firchow: Soloists: Charlotte Gleixner (Contralto), Hans Eggert (Baritone), and Walter Eschenbach (Organ); Aus tiefer Not (Bach); Organ Prelude, O Mensch bewein deine Sünde gross (Bach); Gottes Zeist ist die allerbeste Zeit—Cantata (Bach), for Contralto, Bass, Choir, and Instruments. **9.0,** News.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.—11.40 a.m.** till Close Down, Programme of the Workers' Radio Society (V.A.R.A.). **11.40,** Orchestral Concert, conducted by de Groot: A nous la liberté (Auric); Dort wo die Wälder grün (Brodsky); Birthday Greetings (Ketelbey); Blumen der Liebe (Rust); The Elfs' Serenade (Raymers); Glockenserenade (Kockert); Gramophone Records: The Jolly Yankee (Sadien); Tango (Albeniz); Extract from Four Ballet Airs (Drigo); Das Lied vom süssen Mädel (Reinhardt); Mimi d'amour (Vercolier); Evening in the Odenwald (Foulds); Gramophone Records: Souvenir de Bitolie (Karastnoyanov); None but the weary Heart (Tchaikovsky); Hearts and Flowers (Czibulka); In a Chinese Temple Garden (Ketelbey); Der Weg zum Herzen (Lincke); Czardas (Niklas-Kemper). **1.40 p.m.,** Interval. **1.55,** Dressmaking Lesson. **2.40,** Programme for Children. **5.25,** Gramophone Records. **5.40,** Organ Recital by Jong: Les Fables de La Fontaine (Mouton); Es war einmal ein Zigeuner (Eineg); Selection from The Gold-diggers of 1933 (Warren). **6.10,** Illustrated Talk: Handel's Opera, Julius Cæsar. **6.40,** Talk. **7.0,** Orchestral Concert, conducted by de Groot; Soloist: Franken (Viola): Zeitbilder (Stürmer); Concertino for Viola and Orchestra, Op. 19 (d'Indy); Austrian Peasant Dances (Pachernegg); The Squirrel Dance (Smith); Valse chaloupée (Debourg); El Tango de amor (Filipucci); Bahnfrei (Jos. Strauss); Hydropathen (Gungl); Dance of the Dervishes (Bendix); Clog Dance (Fétras). In the interval at **7.40,** News and Announcements. **8.40,** Talk. **9.0,** Gramophone Records. **9.55,** Dance Music by the St. Louis Boys. **10.40,** Organ Recital by Steyn: Remember my forgotten man (Warren); So Blue (de Sylva); Contemporary Life (Nick); By the Blue Hawaiian Waters (Ketelbey); Shadow Waltz (Warren). **11.10,** Gramophone Records. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW., until **3.40 p.m.** Transmitted from **Kootwijk** from **3.40 p.m.**—Programme of the Christian Radio Society (N.C.R.V.).—**11.40 a.m.,** Police Notes. **11.55,** Gramophone Records. **12.10 p.m.,** Concert by the Alberse Trio: March, El Caprero (Dose); Potpourri, Rund um die Wolga (Borchert); A Perfect Day (Jacobs-Bond); Spanish Dance No. 4 (Moszkowski); Meditation from Thaïs (Massenet); Wenn die Puszta schweigt (Kálmán); Gramophone Records; Russian Song (Smith); Liebesgarten (Schumann); Invitation to the Dance (Weber); Selection from Tannhäuser (Wagner). **1.40,** Gramophone Music. **2.40,** Concert of Chamber Music by Mme. Knеyt-Ter Haar (Songs), Berghout ('Cello), and Mlle. Beute (Pianoforte): Three Sacred Songs (Bach); Sonata in D Minor (Boellmann); Rondo in G (Beethoven); Jesuslied (Hildbach); Two Airs (Rontgen). **3.25,** Interval. **3.40,** Concert (contd.). Spanish Dance (Brucken-Fock); Scherzo macabre (Brucken-Fock); Four Songs; Gramophone Records; Etude (Scriabin-Piatigorsky); Requiebros (Cassado); Prelude in G Minor (Rachmaninov); Olaf's Dance (Pick-Mangiagalli); Panis Angelicus (Franck); Elegy (Massenet); Berceuse (Diepenbrock). **4.40,** Programme for Children. **5.40,** Agricultural Talk. **6.10,** Programme to be announced. **6.40,** Police Notes. **6.55,** Religious News. **7.10,** Gramophone Music. **7.40,** Addresses arranged by the Dutch Union of Young People. In the intervals, Gramophone Records. **9.40,** News. **9.50,** Gramophone Music.

INNSBRUCK.—See **Vienna.**

KALUNDBORG.—See **Copenhagen.**

KATOWICE

734 kc/s, 408 metres; 16 kW.—**6.5 p.m.,** Announcements and Gramophone Music. **6.10,** Talk for Housewives. **6.25,** See **Warsaw. 10.0,** The Letter box in French.

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by **Helsinki, 815 kc/s, 368.1 metres.—4.0 p.m.,** Programme for Children. **4.40,** Programme for Girls. **4.50,** News in Finnish. **4.59,** Time and Weather. **5.10,** News in Swedish. **5.15,** Talk. **5.35,** Songs by the Radio Quartet. **5.50,** Talk. **6.10,** Symphony Concert by the Tampère Municipal Orchestra, relayed from **Tampère, 536 kc/s, 560 metres;** Conductor, Eero Kosonen. Soloist, Timo Mikkilä (Pianoforte): Symphony No. 6 (Tchaikovsky); Pianoforte Concerto, Metamorphoses (Palmgren); The Swans (Raitio). **7.45,** News in Finnish. **8.0,** News in Swedish.

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**1.30 p.m.,** Talk on Beethoven. **1.50,** Discussion with an Atheist. **2.0,** Programme for Young People. **3.0,** See **Stuttgart. 5.0,** Requiem (Mozart), by the Small Choir, and the Station Orchestra and Soloists. Conductor: Josef Breuer. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0 to 9.20,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News. **9.45** till Close Down, See **Stuttgart.**

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—12.10 p.m.,** Concert by the Leipzig Symphony Orchestra, conducted by Theodor Blumer. **1.35,** Songs by a Girls' Choir. **2.10,** Books we are waiting for: Unter den Eichen (Margarete-Schiestl-Bentlage). **2.40,** Book Review. **3.0** (from **Dresden**), Soloist Concert, relayed from the Radio Exhibition. **4.0,** Talk: The Battle of Brzezany. **4.25,** Concert by the Station Orchestra, conducted by Hilmar Weber. **4.55,** Programme for Young People. **5.30,** The Political Struggle (Ernst von Salomon). **6.0,** Transmission for all German Stations: Missa solennis (Liszt), by the Leipzig Riedelverein, the Leipzig Symphony Orchestra and Soloists. **7.0,** Poems. **7.15,** Te Deum (Bruckner), for Soloists, Choir and Full Orchestra. **7.45** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.,** Concert of Chamber Music. **5.30,** Concert by the Station Orchestra. **6.0,** Topical Talk. **6.30,** Literary Talk. **7.0,** See **Prague. 9.0,** Weather and News. **9.15** (approx.), Dance Music.

LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW.—Luxembourg Evening. **7.0 p.m.,** Concert of Luxembourg Music by the Radio Orchestra, conducted by Henri Pensis: Letzeburger Zaldotemarsch (Mertens); Waltz, Lore-Lore (Koster); Gavotte, Marie-Adelaide (Günther); Dicksiana (Kahnt); March, De letzeburger Le'w (All-recht). **7.35,** Recital of Luxembourg Songs to the Guitar by Josey Klein. **8.0,** Literary Talk in French: Charles Becker. **8.10,** Orchestral Music: Selection from Le Roi l'a dit (Delibes); Spanish Caprice (Rimsky-Korsakov). **8.35,** News in French. **8.45,** See **Paris (Radio.Paris).** In an interval at **9.45,** News in German. **10.25,** Dance Music.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.,** Announcements and Gramophone Music. **6.25,** See **Warsaw. 6.45,** Sports Notes. **6.47,** See **Warsaw. 10.5,** Gramophone Music. **10.30** (approx.), Close Down.

MADRID

ARANJUEZ, EAQ, 10,000 kc s, 30 metres; 20 kW.—**10.30 p.m.,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12 Midnight** till **12.30 a.m. (Thursday),** I.B.C. Concert: Song of the Vagabonds; Only a Rose; Selection from The Gipsy Princess; Secrets; Foxtrot, I love you; Kilima Waltz; Hobo, you can't ride this Train; Selection from Congress Dances; Signature Tune. **12.30,** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Topical Talk and Dance Music. **8.15,** Radio Journal. **8.30 to 9.30,** Interval. **9.30,** Chimes, Time and Radio Journal. **9.45** (approx.), Music Competition—Baritone Song Recital by Roman Zorzano: Prologue to I Pagliacci (Leoncavallo); Air from Las Golondrinas (Usandizaga); Aria from Othello (Verdi); O Star of Eve from Tannhäuser (Wagner); El Caserio (Guridi); El juramento (Gaztambide); Air from Maruxa (Vives); El Pinar (Alvarez Cantos); Maria la Tempranica (Gimenez and Moreno Torrobo). After the Recital, Pianoforte Solos. **11.45,** Radio Journal. **12 Midnight,** Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.25 p.m.,** Dance Music by the Station Orchestra, conducted by Musil. **6.0,** See **Prague. 6.10,** Medical Talk. **6.25,** See **Prague. 6.40,** See **Brno. 7.0,** See **Prague. 9.15** (approx.), Close Down.

MOSCOW

KOMINTERN, RW1, 202.5 kc/s, 1,481 metres; 500 kW.—**3.15 p.m.,** Musical Programme. **3.30,** Talk: Agricultural Machinery and Collective Farmers. **4.30,** Red Army Programme. **5.30,** Collective Farms' Programme. **6.30,** Talk by an Aviator. **7.0,** Literary and Musical Programme. **8.0,** Talk in German: Soviet Law. **8.55,** Chimes from the Red Square. **9.5,** Talk in English: Soviet Literature. **10.5,** Talk in Czech: Religion in Soviet Russia.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW.—Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.,** Concert from **Stuttgart.** **4.45,** Talk. **5.5,** Autumn Sadness—Radio Sequence with Gramophone Illustrations. **5.25,** Discussion with Ernst Henne, the Professional Racing Motorist. **5.45,** Time, Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** Liebe, Musik und der Tod des Johann Sebastian Bach—Biographical Radio Play (Althaus). **8.10,** Concert by the Station Orchestra, conducted by Mayer. Soloist: Relly Wittek (Contralto); Overture, Manfred (Schumann); Contralto Solo: Hymne der Liebe, Op. 136 (Reger); Variations on a Russian Folk Song, Op. 55 (Graener). **9.0,** Time and News. **10.0,** Contemporary Bavarian Chamber Music, by the Raba Quartet. String Quartet (Schiffmann); String Quartet (Böttscher). **11.0** (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy, LCL, 6,990 kc/s, 42.28 metres.—4.0 p.m.,** Soloist Concert of Music by Iuga Laerum-Liebich. **5.0,** French Lesson. **5.30** (from **Hamar**), Programme for Boys. **6.0,** Weather and News. **6.30,** Talk: The Origin of the Old Testament. **7.0,** Time. **7.1,** Programme in Memory of the Author, Vilhelm Krag, relayed from Sörlandslaget: Addresses, Recitations, and Songs. **8.30,** Agricultural Notes, Weather and News. **9.0,** Topical Talk. **9.15,** Concert by the Station Orchestra, conducted by Kramm: Soloist: Philip Resberg (Baritone). **10.0,** Dance Music on Gramophone Records. **11.0** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Report, Agricultural Notes and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Orchestral Concert. Soloists: Parlato (Soprano) and Sposito Bonica (Pianoforte). Overture, Medea (Cherubini); Soprano Solos: (a) Margherita (Mazziotti), (b) Oh, la tua bocca (Bettinelli); Barcarolle (Croce); Pianoforte Solos: (a) Mazurka in C sharp (Chopin), (b) Waltz (Chopin), (c) Spanish Songs (Albeniz), (d) Due Lunaires (Pick Mangiagalli); Suite, Aus Holbergs zeit (Grieg); Soprano Solos: (a) Aria from Le roi de Lahore (Massenet), (b) Song (Gounod); Selection from Luisa Miller (Verdi). In the interval, Talk: Confessions before the Microphone. After the Concert, Gramophone Records. **10.0,** Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.15,** Weather. **7.25,** News. **7.45,** Programme for Children. **8.15,** Mozart Concert, conducted by Flament: Soloist: Cantrelle (Violin): Overture, Il Seraglio; Minuet from the Divertissement No. 17 for Strings; Violin Concerto in E Flat; Overture, The Magic Flute; Andante for Strings; Overture, Figaro. **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music. **7.15,** Le Journal Parlé. **7.30,** Sponsored Gramophone Concert. **8.0,** Insurance Societies' Report. **8.30,** Domino—Comedy in Three Acts (Marcel Achard). **11.30,** Orchestral Concert, relayed from the Champs-Elysées Restaurant.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** Press Review and Weather. **12 Noon,** Educational Talk. **12.15 p.m.,** Gramophone Music: La Favorite (Cherubini); Selection from Manon (Puccini); Selection from Romeo and Juliet (Gounod). **12.30,** Organ Recital by Desserre, relayed from the Gaumont Palace. **1.0 p.m.,** Exchange, News and Weather. **1.5,** Gramophone Concert (contd.). In the interval at **1.30,** Exchange. **2.0,** Exchange. **3.45,** Exchange and Market Prices. **6.20,** Agricultural Report, Weather and Market Prices. **6.45,** Gramophone Music. **7.0,** Medical Talk. **7.20,** Popular Concert. **7.50,** Commercial Notes and News. **8.0,** Readings. **8.30,** News and Weather. **8.40,** Fashion Talk by Mlle. José. **8.45,** Concert given by the Association des Concerts Colonne. Conductor: Paul Paray: Symphony No. 7 (Beethoven); Habanera (Laparra): Extracts from Pelléas et Mélisande (Fauré); Forest Murmurs (Wagner); Mazeppa (Liszt). In the interval at **9.15,** Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.—7.0 p.m.,** Musical Originalities, from **New York. 7.30,** KDKA Home Forum. **8.0,** Southern Symphonies, from **New York. 8.15,**

NOV. 22nd WEDNESDAY *continued*

Happy Days in Dixie, from **New York.** 8.45, Human Values. 9.0, Betty and Bob, from **New York.** 9.15, Utility Hall. 9.30, Frances Ingram. 9.45, News and Market Reports. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from **New York.** 10.45, Orphan Annie, from **New York.** 11.0, News, by Pat Haley. 11.15, Sports Notes and Programme Review. 11.30, Evensong. **11.45 to 3.30 a.m. (Thursday), New York** Relay. 11.45, Lowell Thomas. **12 Midnight,** Amos 'n' Andy. 12.15, Gems of Melody. 12.30, Potash and Perlmutter. 12.45, Irene Rich for Welch. 1.0, Crime Clues. 1.30, Dangerous Paradise. 1.45, Red Davis. 2.0, Warden Lawes. 2.30, John McCormack and Orchestra. 3.0, Pedro Via's Orchestra.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See **Bratislava.** 3.50, Dramatic Programme; Introductory Talk; A Scene from The School for Scandal—Play (Sheridan), by the English Players. 4.35, Gramophone Music. 4.45, Talk on Literature. 4.55, Gramophone Music. 5.5, Agricultural Talk. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Topical Talk, Programme for Workers, and Labour Market Report. 6.0, Time, News and Weather. 6.10, Advanced French Lesson. 6.25, Travel Talk. 6.40, See **Brno.** 7.0, Introductory Talk to the following Transmission. 7.5, Suk Concert by the Czech Philharmonic Orchestra, conducted by Vaclav Talich, relayed from the Smetana Concert Hall; Soloist, Karel Hoffmann (Violin): Dramatic Overture, Op. 4; Fantasia for Violin and Orchestra, Op. 24; Tone Poem, The Tale of Summer, Op. 29. 9.0, Time, News, Review of the Day and Sports Notes. 9.15, News in French. 9.30 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—6.0 to 6.15 a.m. (from **Lausanne),** Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from **Lausanne**), Gramophone Concert. **12 Noon** (from **Lausanne**), Financial Notes. 12.10 p.m. (from **Lausanne**), Gramophone Concert (contd.). 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, Programme from **Schweizerischer Landessender.** 5.0 (from **Geneva**), Programme for Children. 6.0 (from **Geneva**), Talk: The Origin and Development of the Calendar. 6.20, Talk: The League of Nations and the Future of the Calendar. 6.30 (from **Geneva**), Radio Chronicle. 6.59, Weather Report. 7.0 (from **Geneva**), Harpsichord Solos by Charles Koller. 7.15 (from **Geneva**), Talk on Madame de Genlis. 7.35 (from **Geneva**), Choral Music from the Twelfth to the Seventeenth Century. Concert relayed from the Conservatoire; Soloist, Yves Tinayre (Tenor). 8.20, News and Weather. 8.30 (from **Geneva**), Popular Programme. 9.0 (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW. 9.0 p.m., Time Signal, followed by Music by the Radio Trio. 9.30, Reading. 10.0, News. 10.30, Faust—Opera (Gounod).

RIGA

571 kc/s, 525.3 metres; 15 kW.—6.0 p.m., Weather. 6.5, Extracts from Italian Opera. The Orchestra conducted by Parups. Soloist: Brechmanns-Stengels (Songs). 7.0, News. 7.20, Extracts from French Opera. 8.0, Weather and News. 8.30, Popular Music. 9.30 (aprox.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Gall 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from 7.45 p.m., and **2RO, 11,810 kc/s, 25.4 metres.**—12 Noon to 1.15 p.m., Orchestral Concert: L'allegra parata (Montagnini); Solo col mio povero cuore (Caviglia); Sherzo from Cleopatra (Mancinelli); Sogno azzurro (Barzizza); Selection from Clo-Clo (Lehár); Ich liebe dich (Dauber); Valze' di sogno (Rampoldi); Banjo pazzo (Dax). In the intervals from 12.30 to 12.45, Giornale Radio and Exchange, and at 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio, Exchange and Report of the Royal Geographical Society. 4.10, Weather. 4.15 to 5.0, Orchestral Concert: Napolitan Radio (Ciaramella); Risveglio montano (Cortopassi); A Thousand and One Days (Dax); Prelude, Buffalmacco (Gasco); Spring Song (Mendelssohn); Fuori programma (Carisch-Ripa); Bolero, Querida mia (Ricciardi); Juanita (Hamud). 5.40 **(Naples),** Shipping and Sports Notes. 5.45, Dopolavoro Report and Tourist Report. 5.57, Report of the International Institute of Agriculture (in Italian and English). 6.10, Wheat Market Report. 6.40, Giornale Radio. 7.0, Time, Announcements and Gramophone Music. 7.15, See **Turin.** 7.30, Giornale Radio and Sports Notes. 7.45, Concert by the Orchestra of the Royal Philharmonic Academy, conducted by Vincenzo di Donato. Soloist: Giulio Rotoli (Pianoforte). Concerto grosso (Bomportis-Donato); Concerto in D minor for Pianoforte and Orchestra (Bach); Talk: The Legend of St. Cecilia; Lento (Peragallo); Three Miniatures (Santoliquido): (a) La danza di Ranocchietto verde, (b) Il sogno di Teddy Bear, (c) Fanfara per i soldatini di piombo; Theatre Notes. 9.0 (approx.), Variety Music and Dance Music. 10.0, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.**—7.30 a.m., Milady's Matinee, from **New York.** 12.45 a.m. **(Thursday),** Stock Reports. 1.0 to 3.30, **New York** Relay. 1.0, George Olsen's Orchestra. 1.30, Waltz Time. Frank Munn (Tenor); Orchestra. 2.0, Ipana Troubadours. 2.30, Leo Reisman's Orchestra. 3.0, Variety Programme. 3.30, National Radio Forum, from **New York,** followed by Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.: **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—5.50 to 6.5 a.m., Gymnastics. 9.20 (from **Berne**), Broadcast for Schools. 9.50, Interval. 11.0 (from **Berne**), Gramophone Concert. 11.29, Time from Neuchâtel Observatory. 11.40 (from **Berne**), Music by Al Berlin and His Boys. 1.25 (from **Berne**), Time, Weather and Exchange. 1.30 (approx.), Interval. 2.30 (from **Berne**), Programme for Women. 2.59, Time Signal from the Neuchâtel Observatory. 3.0, Programme to be announced. 4.30, Tenor, Baritone, 'Cello and Pianoforte Recital. 5.0 (from **Berne**), Programme for Children. 5.30, Programme to be announced. 6.0 (from **Zürich**), Time, Weather and Market Prices. 6.20 (from **Zürich**), English Lesson. 6.50 (from **Zürich**), Reading. 7.45 (from **Zürich**), Introductory Talk to the 8.10 p.m. Transmission. 8.0, Weather and News. 8.10, German Programme. 9.15 (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—12 Noon to 12.30 p.m., Broadcast for Schools. 4.5, Organ Recital of Light Music by Gösta Berlin. 4.30, Reading. 5.0, Gramophone Music. 6.0 (from **Sundsvall**), A Dialogue. 6.15, Weather and News. 6.30, Astronomy Talk: The Milky Way, relayed from **Malmö, 1,301 kc/s (230.6 metres).** 7.0, Symphony Concert, conducted by Tor Mann: Soloist: Karin Branzell (Songs); Symphony, Op. 104, No. 6 (Sibelius); Kindertotenlieder (Mahler). 7.55, Literary Review. 8.25, Pianoforte Recital by Brita Hjort, relayed from **Malmö:** Theme with Variations in B Minor; Minuet (Friedman); Waltz (Lack). 8.45, Weather and News. 9.0, Dance Music, relayed from the Bern Hall.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Classical Music on Gramophone Records. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Orchestral Concert of Popular Music, conducted by Maurice de Villers. 2.0, Interval. 4.45, Talk on Electricity. 5.0, Recital of French Songs by Jane Sempé and Marcel Enot, with Commentary by Germaine Weill. 6.9, Talk: November 22nd, 1918. 6.15, Orchestral Concert, conducted by Maurice de Villers; Soloists, Mmes. Genya Marat and Barth (Songs) and Lucien Weber (Recitations); Overture, Patrie; Marche militaire (Wormser); Selection from The Drum-Major's Daughter (Offenbach); Air from La Vivandière (Godard); Trumpet Solo, Mazurka (Petit); Recitations; Air from The Daughter of the Regiment (Donizetti); Marche militaire (Saint-Saëns). 7.30, Time and News. 7.45, See **Paris (Eiffel Tower).** 8.15, Press Review in German, Lottery Results, and Announcements. 8.30, Orchestral Concert, relayed from the Conservatoire, **Metz;** Conductor, René Delannay; Soloist, Lina Falk (Songs): Overture, Euryanthe (Weber); Le chasseur maudit (Franck); Kaa (Bloch); Selection from Orfeo (Monteverde); Symphonic Poem, Orpheus (Liszt): Act II of Orpheus (Gluck). In an interval, Talk: The Palais de Justice, Metz. 11.0, Dance Music, relayed from the Savoy. **12 Midnight** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metes; 1.5 kW.—Relayed by **Freiburg, 527 kc/s, 570 metres.**—12 Noon, Topical Talk. 12.15 p.m., Gramophone Concert. 2.0, See **Langenburg.** 3.0, Concert by the Station Orchestra and Soloists. Conductor: Otto Seyfert. 5.0, See **Langenberg.** 5.30, Reading (Maisack). 5.50, Time and Weather. 6.0, Transmission for all German Stations, relayed from **Leipzig, 7.0 to 9.20,** See **Frankfurt.** 9.20, Things you should know. 9.30, News. 9.45, Gramophone Music. 10.0, Gramophone Records: Mass in B Minor (Bach), by the Philharmonic Choir and London Symphony Orchestra, conducted by Albert Coates. Soloists: Elisabeth Schumann (Soprano), Walter Widdop (Tenor), and Friedrich Schorr (Baritone). 12.15 a.m. **(Thursday),** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

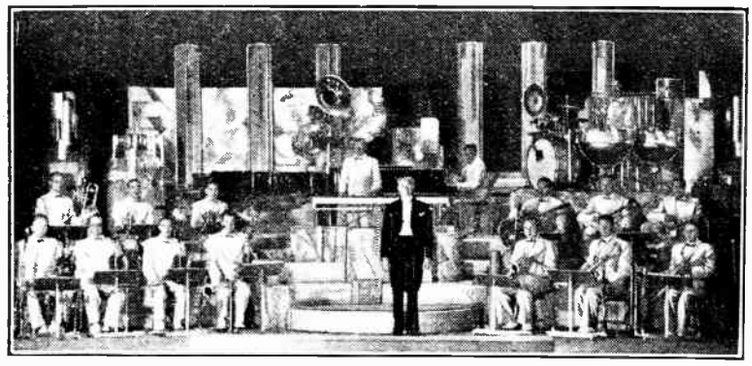
RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Accordion Solos. 6.30, Extracts from Sound-Films. 6.50, Andante and Allegro (Bach). In the interval, Talk. 7.15, News. 7.30, Rapsodie espagnole (Ravel), by the Station Orchestra. 7.45, Russian Songs and Balalaika Music. 8.0, Military Music. 8.15, Opera Music: Arias from Sappho (Massenet), Le roi de Lahore (Massenet); La Traviata (Verdi), and I Pagliacci (Leoncavallo). 8.30, Orchestral Music: Valse pourdée (Popy); Selection from Masaniello (Auber); In a Chinese Temple Garden (Ketelbey); Radetzky March (Joh. Strauss). 8.45, Chansonnettes. 9.0, Concert by the Paladienne Concert Society, conducted by Canteyns: Two Step, La Giralda (Huarranz); Overture (Rizzi); Doux Rêve and Aubade (Rizzi); One-Step (Delys); In Indian File (Macioechi); Fantasia, Demon and Angel (Bert); Serenade, To a Star (Macioechi); March (Wagner). In the interval, Extracts from Sound-Films. 10.15, News. 10.30, Concert for Listeners in Morocco: Music by a Viennese Orchestra; Jeannine (Shilkret); Barbara (Silver); Selection from Der Rosenkavalier (Richard Strauss); Opera Music: Arias from Don Giovanni (Mozart), La Juive (Halévy), and Siegfried (Wagner). 11.0, Light Music. 11.15, Dance Music. 12 **Midnight,** News. 12.5 a.m. **(Thursday),** Songs. 12.15, Light Music. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down. See **Turin.**

TRONDHEIM.—See **Oslo.**

NOV. 22nd WEDNESDAY *continued*



A FAMOUS DANCE BAND. Few listeners to foreign stations can have missed the celebrated A.V.R.O. dance orchestra, which broadcasts regularly from Hilversum. Judging from the picture, the band must owe some of its brilliancy to its gorgeous setting.

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—4.10 p.m., Song Recital. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Report and Gramophone Music. 6.0, Time, Tourist Report, and Gramophone Music. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, News and Weather. 7.15, Medical Talk. 7.30, Dramatic Programme, followed by Orchestral Concert. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in Spanish. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—11.0 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer. In an interval at **12 Noon,** Weather. 1.0 p.m., Interval. 2.0, Time and Announcements. 2.20, Talk: The Dairy Industry in Austria. 2.30, Programme for Young People: A Journey to Rome in the Old Days. 2.55, Operetta Music on Gramophone Records. 3.35, Talk: Speech in Acting—The more natural, the better. 4.5, Educational Talk. 4.25, Contemporary Austrian Composers Karl Weigl; Concert by the Weiss Quartet and Hedda Bullon (Pianoforte): String Sextet in D Minor; Pianoforte Solo: Nachtphantasien, Op. 13. 5.5, Medical Talk. 5.30, Talk for Workers—Women's Rights. 5.55, Reading (Rudolf Hawel). 6.25, Time and Announcements. 6.35, Anniversary Concert by the Gesellschaft der Musikfreunde Choral Society and the Wiener Symphoniker, Conductor, Ferdinand Grossman: Cantata, Nun ist das Heil und die Kraft (Bach); Missa Solemnis in F Minor (Bruckner). 8.30, Topical Talk. 8.45, Concert by the Wiener Symphoniker, conducted by Holzer; Soloist, Anny Sieburg (Soprano). In an interval at 9.15, News. 10.10, Talk: Winter Sports in Austria, followed by Announcements

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time and Fanfare from the Tower of St. Mary's Church, Cracow. 11.5, Popular Polish Music on Gramophone Records. 11.30, Radio Journal. 11.35, Weather. 11.38, Old Operetta Music on Gramophone Records. **12 Noon.** Interval. 2.30, Economic Notes. 2.40, Song Recital by Rechtleben (Baritone). I tuoi labbie (Lotti); Serenade from Don Giovanni (Mozart); Cavatine from The Barber of Seville (Rossini); D'ou viennent les premiers étoiles (Karlowicz); Two Songs (Moniusko). 3.0, Gramophone Music. 3.10, Programme for Children, relayed from **Lwów, 788 kc/s, 381 metres.** 3.40, Answers to Correspondents. 3.55, Concert of Chamber Music by Szulc (Horn), Snieckowski (Oboe), and Urstein (Pianoforte). Trio, Op. 61 (Herzogenberg); Trio, Op. 188 (Reinecke). 4.50, Agricultural Correspondence. 5.0, Talk. 5.20, Light Music, relayed from the Gastronomia Café. Waltz (Waldteufel); Spanish Serenade (Micheli); Fantasia on Themes of Suppé; Tango (Castrucho); Foxtrot (Whin-Noble). 6.0, Programme Announcements. 6.5, Miscellaneous Items. 6.25, Reading 6.40, Sports Notes. 6.47, Radio Journal. 7.0, Flower Songs (Stolz), sung by Mme. Szlemińska. 7.25, Concert by the Tychowski Guitar Orchestra. Ah, pardon (Panufnik); Une autre fois (Danhemar); L'amour arrive à l'improviste (Jaworski-Wrzos); Love Song of the Nile (Brown); Waltz Tychowski Foxtrot (Wars); Les jours passés (Dan); Vienna, Vienna (Sieczynski); Two Romances; Slow Foxtrot (Tychowski). 8.0, Reading. 8.15, Pianoforte Recital by Drzewiecki. Partita in G Flat (Bach); Sonata in E Flat (Mozart); Three Pieces (Prokoliev): (a) Prelude in C, (b) Gavotte from the Classique Symphonie, (c) March in F Minor; Three Pieces (Debussy): (a) La fille au cheveux de lin, (b) Le vent dans la plaine, (c) Minstrels. Three Pieces (Albeniz): (a) Cordoba, (b) Tango, (c) Sevilla. 9.0, Talk in Esperanto. 9.20, Dance Music from the Ziemianska Café. In the interval at 10.0, Weather and Police Notes.

WILNO

530 kc/s, 566 metres; 16 kW.—6.20 p.m., Miscellaneous Announcements. 6.25, See **Warsaw.** 6.45, Miscellaneous Announcements. 6.47, See **Warsaw.** 9.0, Humorous Monologue. 9.20, See **Warsaw.** 10.30 (approx.), Close Down.

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—6.20 p.m., Talk. 6.35, Announcements. 7.5, See **Prague.** 9.0, News, Weather and Announcements. 9.15, Dance Music by the Sever Orchestra, relayed from the Grill Room. 10.0 (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender.**

THURSDAY
NOVEMBER THE TWENTY-THIRD

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **5.0,** Programme for Children. **6.45,** News. **7.0,** French Lesson. **7.15,** Poetry Recital by F. Gleeson. **7.30,** Time Signal. **7.31,** Concert by the Station Orchestra. **8.0,** Soprano Solos by May Doyle. **8.15,** Pianoforte Recital by Dina Copeman. **8.30,** Gaelic Songs. **8.45,** The Station Orchestra. **9.0,** Silver Symphony, by Gertrude Quinn and Company. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Dance Music. Learn to Croon (Coslow); Happy as the day is long (Koehler); Dream on (Tobias); Lazybones (Mercer). **9.45,** Light Music. Banjo Solo; Overture, Poet and Peasant (Suppé—arr. de Pietro); Song: I don't wanna be rich (Robison); Xylophone Solo: Acroplane Polka (Gaston); March, Viva la Liberta (de Pietro). **10.0,** Concert of Dance Music. Under a Blanket of Blue (Symes); Trouble in Paradise (Wever); Mam, yo quiero un novio? (Collazo); Racing Commentary; Can't we meet again?; Home-Made Heaven; Leave a little for me (Abraham); Play, fiddle play (Laurence). **10.30,** I.B.C. Goodnight Melody, followed by Weather and News. **10.40,** Light and Shade in Variety. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 358 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert. In the interval: Talk. **7.0,** Request Gramophone Records. **7.30,** Exchange and Gramophone Records (contd.). **8.0,** Gramophone Music and News. **8.30,** Catalan Educational Programme: History and Geography Lesson. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5,** Part Relay of an Opera from the Gran Teatro del Liceo. In the interval at **11.0,** News.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Women. **3.50** (approx.) to **7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—**6.0 p.m.,** Gramophone Music. **6.10,** Talk. **6.30,** Radio Play. **7.0,** Song Recital by Katica Jovanovic. **7.30,** Symphony Concert by the Philharmonic Orchestra, conducted by George Fitelberg. **9.10,** Time and News. **9.15** (approx.), Dance Music, relayed from the Auto Club.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**1.0 p.m.,** Gramophone Concert of Italian Opera Music: Overture to and Two Airs from The Barber of Seville (Rossini); Selection from I Pagliacci (Leoncavallo); Two Airs from La Bohème (Puccini); Prelude and Selection from La Traviata (Verdi). **1.45,** Talk for Mothers. **2.10,** Recital of Children's Songs. **2.30,** Weather and Exchange. **2.45,** Reading. **3.0,** See **Heilsberg. 4.0,** Programme for Young People. **4.20,** Song Recital by Luise Worthmann von Rogovsky. **5.0,** Poems. **5.5,** Variety Programme. **5.30,** Agricultural Programme. **5.50,** Weather and News. **6.0,** Transmission for all German Stations relayed from **Munich. 7.0,** To-day's Motto. **7.2** (approx.), Request Gramophone Music. **8.0,** See **Berlin (Funkstunde). 9.0,** News. **9.25,** Talk: Sport and the Physique of a Race. **9.45,** Weather. **10.0,** See **Langenberg. 11.30** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419.5 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB** and **DJE.—6.0 p.m.,** Transmission for all German Stations, relayed from **Munich. 7.5,** See **Munich. 8.0,** In Cupid's Realm—Radio Pictures (Paul Schaaf and Georg Mühlen-Schulte), with Incidental Music by Karl Knauer. **9.0,** News. **9.15** (approx.), Dance Music. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News and Exchange. **7.40,** Talk arranged by the International Labour Bureau. **7.55,** Lottery Results. **8.0,** Talk on Wines. **8.1,** News. **8.30,** Cabotins—Comedy in Four Acts (Pailleron).

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—**5.25 p.m.,** Gramophone Music. **5.40,** Talk. **5.55,** Hints for Housewives. **6.0,** See **Prague. 7.10,** Concert by the Station Band, conducted by Nagl. **7.50,** See **Prague. 8.20,** See **Brno. 9.0,** See **Prague. 9.40** (approx), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—11.0 a.m.,** Concert by the Station Orchestra, conducted by Topitz: Overture, Russian and Ludmilla (Glinka); Selection from I Pagliacci (Leoncavallo); Waltz, An der schönen grünen Narenta (Komzak); March of the Tin Soldiers (Nedbal); Hungarian Fantasia (Lehár); Schäfertanz (Gungl); Petite Suite (Coleridge-Taylor); Revolutionsmarsch (Zander); Overture, Giroflé-Girofla (Lecocq); Ballad (Mauss); Serenade, Ein Frühlingsgruss (Schicke); Waltz, Märchen aus Alt-Wien (Ziehrer); Selection from Die Fledermaus (Joh. Strauss); Narcissus (Nevin); Schönfeld-Marsch. In an interval at **12.45 p.m.,** Time and News. **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.30,** Talk: The Power of the People. **2.40,** Programme for Children. **3.0,** Concert of Light Music by the Kurt Sparmann Orchestra, relayed from the Kaffee Vaterland. In an interval at **4.10,** Agricultural Prices. **4.40,** Reading (Paul Knappe). **5.0,** Discussion on he Potter's Art To-day and in the Past. **5.20,** Programme to be announced. **5.45,** Programme Announcements. **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** News. **7.10,** Concert by the Silesian Philharmonic Orchestra, conducted by Wolfgang Fricbe:. Overture, The Taming of the Shrew (Goetz); Hungarian Rhapsody (Friebe); Ballet Music from La Gioconda (Ponchielli); Two Slave Dances (Dvorák); Overture, Der Opernball (Heuberger); Waltz, Hofballtänze (Lanner); Potpourri, Rendez-vous bei Lehár (Hruby). In an interval at **7.50,** Astronomical Talk: The Heavens in November. **9.0 to 9.45,** See **Munich. 9.45,** Time and News. **10.10,** Dance Music on Gramophone Records. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.0 p.m.,** Concert of Schrammel Music by Drabek (Violin), Placek (Accordion) and Svoboda (Guitar). **3.50,** See **Prague. 4.15,** Programme for Young People. **4.25,** See **Prague. 4.50,** Gramophone Music. **5.0,** Theatre and Film Review. **5.15,** See **Prague. 5.25,** German Transmission: News, followed by The Merchant, Play in Six Scenes (Anton Hamik). **6.0,** See **Prague. 7.10,** See **Bratislava. 7.50,** See **Prague. 8.20,** Concert of Light Music by the Station Orchestra, conducted by Suchy. **9.0,** See **Prague. 9.40** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans. Overture, The Thieving Magpie (Rossini); Waltz, Jolly Fellows (Vollstedt); Serenade (d'Ambrosio); Selection from Carmen (Bizet); Violin Solo: La Gitana (Kreisler); Weber Potpourri (Tavan); Aubade (Caludi); Selection from Ciboulette (Hahn). **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert. Java des fleurs d'orangers (Mireille); Tyrolese Serenade (Servan); Waltz, La Gitana (Bucalossi); Pensée d'automne (Masscnet); L'étoile du berger (Blaugy); Les petits chapeaux (Mireille); Waltz (Somers); Waltz Song, Les harengs-saurs (Grayssac); Concert Paraphrase on Rigoletto (Verdi-Liszt); Extracts from the Suite, Summer Days (Coates). **5.0,** Concert by the Radio Orchestra, conducted by Walpot. March (Blakenburg); Waltz, Quand l'amour meurt (Crémieux); Overture, La dame blanche (Boieldieu); Two Pieces (Dalcroze): (a) La Chère maison, (b) Le cour de ma mie; Viennese Pieces (Kreisler). **5.30,** Programme for Children. **6.0,** Fashion Talk. **6.15,** Gramophone Concert of Variety Music. **7.15,** Talk for Workers. **7.30,** Sports Talk. **8.0,** Concert by the Radio Orchestra, conducted by Walpot. Soloist: Ferrari (Violin); Walloon Suite (Wangermée). **8.15,** The Hero and the Soldier—Play (Bernard Shaw). **8.45,** Talk. The Deaf Mutes and the Blind. **9.0,** Orchestral Concert (contd.). Stolz Potpourri (Dostal); Campana a sera (Billi); Selection from La fille de Madame Angot (Lecocq); Violin Solo: Zigeunerweisen (Sarasate); Ballet Music from The Queen of Sheba (Gounod); Selection from Wonder Bar (Katscher). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Gramophone Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans. Overture, Le postillon de Longjumeau (Abraham); Miniature Overture (Coates); Russian Song, The Two Guitars (arr. Salabert); Gramophone Record: Duet from Norma (Bellini); Berceuse de Jocelyn (Godard); Selection from The Bird-Fancier (Zeller); Extracts from Sylvia (Delibes). **5.0,** Programme for Invalids. **5.30,** Invitation to the Waltz (Weber), on Gramophone Records. **5.45,** Programme for Children. **6.30,** Variety Programme. **7.12,** News. **7.15,** Talk. **7.30,** Talk for Women. **8.0,** Concert by the Station Symphony Orchestra, conducted by Meulemans. Song (Meulemans); Comedy Overture (Kéler Béla); Selection from Il Trovatore (Verdi); Waltz from The Count of Luxembourg (Lehár); Dances from Prince Igor (Borodin); Wiener-Bonbons (Joh. Strauss). **8.45,** Talk: The Catholic Point of View. **9.0,** Concert (contd.): March, Stars and Stripes (Sousa); Romance in F for Violin and Orchestra (Beethoven); Spanish Caprice (Rimsky-Korsakov); Gavotte (Lully): Scherzo (Lalo); Minuet (Boccherini); Rhythms (Coates); Ballet Music from Sylvia (Delibes). **9.55,** Evening Prayer. **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert of Variety Music by the Dineo Orchestra. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Talk. **6.40,** An Opera (on Gramophone Records). In the intervals, Reading and Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.; Also relayed on **840 metres** from **7.30 p.m.** till Close Down.—**4.30 p.m.,** Concert by the Somogyi Orchestra. **5.30,** Talk. **6.0,** Song Recital by Henrik Vertes and Bela Salver. **7.10,** News. **7.30,** Gramophone Concert. **8.30,** Concert by the Molles String Quartet: String Quartet in A Minor (Brahms); String Quartet in F (Haydn). **9.0,** Hydrographic Report. **9.30,** Concert by the Csorba Cigány Band from the Hotel Britannia. **10.0,** Talk in English: The Violin in Gipsy Music.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres.—** and **Shamlebaek OXY.—11.0 a.m.,** Time and Chimes from the Town Hall. **11.5,** Concert by the Nielsen String Ensemble, relayed from the Ritz Restaurant. **1.0 p.m.,** Interval. **1.30,** Reading. **2.0,** Music by the Teddy Petersen Orchestra, relayed from the Wivex Restaurant. **3.45,** Programme for Boys. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: The Y.W.C.A. in Denmark. **5.15,** Elementary English Lesson. **5.45,** Weather. **6.0,** News. **6.15,** Time Signal. **6.16,** Talk: **6.45,** Danish Lesson. **7.10,** Concert by the Radio Symphony Orchestra, conducted by Fritz Busch. Soloist: Rudolf Serkin (Pianoforte). Overture, The Magic Flute (Mozart); Pianoforte Concerto, No. 1, in D Minor, Op. 15 (Brahms); Pianoforte Solo: Six Etudes from Op. 25 (Chopin); Symphony, No. 4 in B Flat, Op. 60 (Beethoven). **9.15,** News. **9.30,** Reading (Kamban). **9.55,** Dance Music from the National Scala. **11.0,** Time and Chimes from the Town Hall.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**10.30 to 11.30 a.m.,** Programme in English by the I.B.C. **10.30 a.m.,** Happy Hour: Signature Tune; To the Spring (Grieg); Violin Solo, Souvenir (Drdla); In a Country Lane (Coates); Waltz from Coppelin (Delibes); Song: The Vagabond (Vaughan Williams); Norwegian Dance No. 2 (Grieg); Cavatina (Raff); Rakoczy March (Berlioz). Part II: Request Dance Programme: Trouble in Paradise (Wever); In the Valley of the Moon (Schuster); Love is the Sweetest thing (Noble); Castles in the Sand (Sandford); Pop Gun (Sarony); I've told every little Star (Hammerstein); Goodnight but not Goodbye (Roberts); Live, Laugh and Love (Heymann); Signature Tune. **11.30,** Programme in French. **3.30 to 6.0,** Programme in English by the I.B.C. **3.30,** Military Music: Hungarian Rhapsody (Liszt); Carry on (Dundas); Cradle Song (Brahms); Marche Militaire (Schubert); March Past of the Brigade; Selection from Rigoletto (Verdi); Riders of the Flag (Sousa). **4.0,** Dance Music: Dear Stranger (Hansen); Sadie the Shaker (Miller); Love in the Moonlight (Lewis); Rocky Road (Gibbs); Since Maggie became Margaret; Julien (Gartman); Waltz Medley (arr. Simpkin). **4.30,** The I.B.C. Nursery Corner, with Columbus and Belinda; Birthday Greetings Trumpets. **4.40,** Worthing and Littlehampton Concert of Gramophone Records: Signature Tune, The Night by the Sea; Harlem Holiday (Koehler); Hand me down my walking cane; Idylle Bretonne (Gennin); Paradise (Brown); The Smoking Concert; Song: Jolly Old Ma, jolly Old Pa (Wallace); Jack Payne's Memories; On the Edge of the Lake (Coates); Milano (Le Clerq); We all go the same way (Lauder). **5.20,** Brighton and Hove Concert: Organ Recital: The Penguin's Patrol (Reaves); Reminiscences of Gilbert and Sullivan; My Moonlight Madonna (Webster-Fibich); Song: Poor Man's Garden (Russell); Unrequited Love (Lincke); There's an Organ Playing in my Dreams (Condor); Potted Overtures (Engleman); Signature Tune. **5.45 to 6.0,** Concert: Snowball (Carmichael); Mi Amor esta en el Valle (Barreto); Lay your head on my shoulder (Conrad); Reflections in the Water (Loeb). **6.0,** Programme in French. **10.0** till Close Down, Programme in English by the I.B.C. **10.0** (approx.), Light Music: Yip-I-addy-I-ay (Cobb and Flynn); A Cottage for Sale; The Busy Bee (Bendix); No, No, Nanette (Youmans); Song: Letting in the Sunshine (Gay); After the Ball (Harris); Clarinetitis (Goodman); Sweet Sue, just you (Young). **10.30,** Dance Music: Signature Tune, Bells of Normandy; Adios Goodbye (Frankau); Moths around the Candle Flame (Randal); If you'll say "Yes" Cherie (Noble); Lay your head on my shoulder (Conrad); My Moonlight Madonna (Fibich); My Gipsy Rhapsody (Lawrence); My Lucky Day (Parr-Davies); Seven years with the wrong woman (Miller). **11.0,** Talkie Time—Tunes from the Talkies and Shows: Signature Tune, Sittin' in the Dark; Selection from Give me a ring (Broones); Truly Rural Gentlemen (Heymann); The Whip (Harbach); Look what you've done (Kalmar); Whistling under the moon; You are too beautiful (Rodgers); Making a Talkie (Clapham and Dwyer); Signature Tune. **11.30,** Concert arranged by the I.B.C. (Ireland), Ltd.: Signature Tune, Come back to Erin; The Gipsies (Higgs); Glow-worm's Wedding (Siede); Souvenir (Chuckerbury); In far away Donegal (Alexander); Violin Solo: An Old Viennese Dance (Vöglein); Ireland, Mother Ireland (Loughborough); For Love Time (Remy); Destiny Waltz (Baynes); Signature Tune, Come back to Erin. **12.5 a.m. (Friday),** Late News Bulletin in English. **12.10** (approx.), Club Concert for Kenilworth Listeners: Signature Tune, The Chum Song; For you, just you, my Baby (Totter); The Last Round Up (Hill); Tick, Tock (Vienna); Dinner at Eight (Fields); Shadows on the Swanee (Young); Egypt (Wallace); Whistling under the Moon (Hargreaves); Isn't it Heavenly (Hamburg); In the Valley of the Moon (Burks); Oh Johanna (Lawrence); Elvira (Paolita); Little Nell (Divina); The Wedding of Mr. Mickey Mouse (Pola); Signature Tune. **1.0,** Instrumental Solos: A Shower of Notes (Steele); Harmonica Duet: Polly (Zameenik); Song; You're still my Sweetheart (Yellen); Pianoforte Solo: Everyone says I love you (Kalmar); Ocarina Solo: Under the Double Eagle (Tapiero); When the Circus comes to Town (de Rance); Piccolo Solo: Deep Blue Sea (Brewer); Selection, Words and Music (Coward). **1.30,** Light Music: The Little Company (Ganglberger); Rhapsody in Blue (Gershwin); Valeta Medley (Varney); Your Song of Paradise; My Lady Dainty (Ilesse); To-day I feel so Happy (Abraham); The Ghost Walk; The Enchanted Forest (Spahn). **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.25,** News. **12.35,** Concert by the Station Orchestra, conducted by Walter Caspar. Overture, Frühlingsluft (Joh. Strauss); Gavotte from The Queen's Kerchief (Joh. Strauss); Selection from Dr. Piccolo (Lecocq); Waltz (Ivanovici); In Hammersbach (Elgar); Selection from Flotte Bursche (Suppé); Waltz, Flott durchs Leben (Translateur); Schiffsjungen Marsch (Millöcker). **1.40,** Programme for Young People. **2.30,** Sports Notes and Weather. **2.40,** Time and Economic Notes. **3.0,** See **Langenberg. 5.0 to 5.35,** See **Stuttgart. 5.35,** Talk. **5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** Topical Talk. **7.10,** Variety Programme. **9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News and Weather. **9.45,** Light Music. **10.0,** See **Langenberg. 12 Midnight** (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

NOV. 23rd THURSDAY *continued*

HAMBURG

Call ha (in Morse), **806 kc/s, 372 metres;** 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—5.0 p.m.,** Transmission for all German Stations, relayed from **Munich. 7.0** (from **Kiel**), Weber Concert by the Kiel Orchestra of Unemployed Musicians, the Eutin Choirs and the Plöner Choir, relayed from the Composer's Native Town, Eutin. Conductor: Andreas Hofmeier. Soloist: Bernhard Jakschtat (Baritone). Symphony No. 2 in C; Selection and Baritone Aria from Euryanthe; Kampf und Sieg—Cantata for Soloists, Choir and Orchestra, with Introductory Talk. **8.20,** Concert by the Station Male Voice Choir and Women's Vocal Quartet, conducted by Gerhard Gregor: Waltz, Wiener Blut (Joh. Strauss-Pircher); Wein und Liebe (Schubert); Die Heinzelmännchen (Loewe); Fata morgana (Einödsshofer); Women's Quartet: (a) Ohne dich (Köhler-Arlen), (b) Es blüht ein Rosenstrauch (Maier); Egyptian March (Joh. Strauss-Keldorfer). **9.0,** Time and News. **9.30,** Dance Music relayed from **Berlin (Funkstunde).** In an interval at **10.0,** Topical Talk. **11.0** (approx.), Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert of Classical Music. In the intervals at **12.20** and **1.0,** News. **1.30** (from **Danzig**), Danzig Exchange. **2.0,** Agricultural Prices and Exchange. **2.30,** Programme for Young People. **3.0,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, The Battle of Legnano (Verdi); Ballet Music from The Queen of Sheba (Gounod); Italian Suite (Becce); Czokonay-Ouvertüre (Keler-Bela); Humoresque and Gavotte (Reger); Romaneska (Zikov); Polka from Two Widows (Smetana); Waltz, Gruss aus Wien (Joh. Strauss); Overture, The Ace of Hearts (Künneke). In an interval at **3.50** (approx.), Book Review. **4.35,** Agricultural Talk. **5.0,** Gramophone Concert of Variety Music. **5.15,** Agricultural Prices. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0,** Weather and News. **7.10,** Soprano Song Recital by Ruth Schöbel. **7.30,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Abu Hassan (Weber); Minuet and Scherzo (Schubert); Northern Suite (Frederiksen); Styrian Dances (Kienzl); Sommerfahrt-Suite (Zöllner); Overture, Gasparone (Millöcker). **8.30,** Reading (Curt Strohmeyer). **9.0,** News.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.** Programme of the General Broadcasting Society (A.V.R.O.).—**11.40 a.m.,** Time Signal. **11.41,** Concert of Light Music, conducted by Rentmeester. In the intervals, Gramophone Records. **1.55 p.m.,** Interval. **2.10,** Light Music by Cornelius Codolban and his Orchestra. **2.40,** Dressmaking Lesson. **3.25,** Gramophone Music. **3.40,** Programme for Hospitals. **4.10,** Song Recital by Anne Marie Boezaardt. **4.35,** Gramophone Music. **4.40,** A Radio Play for Children. **5.10,** Concert of Light Music by Kovacs Lajos and his Orchestra. **6.10,** Sports Talk. **6.40,** Concert (contd.). **7.10,** English Lesson. **7.40,** Time Signal. **7.41,** News. **7.45,** Concert Version of L'Arlésienne-Ohem (Bizet), by a Narrator Choir and Orchestra. **10.25,** Gramophone Music. In the interval, Radio Report by an Eye-Witness of the Six Days' Racing at **Amsterdam. 11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.;** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.—11.55 a.m. to 1.40 p.m.,** Programme of the Catholic Radio Society (K.R.O.). **11.55,** Concert by the K.R.O. Orchestra, conducted by van 't Woud: March, Granada (Garcia); Overture, Il Guarany (Gomez); Caucasian Sketches (Ippolitov-Ivanov); Legend (Dvorak); Waltz Potpourri No. 2 (Robrecht); Gramophone Music: Tarantella (Godard); Eysler Potpourri (Hruby); Serenade to Toscanini (Mureillo); Selection from La Mascotte (Audran); French Comedy Overture (Keler-Bela). **1.40 to 7.40,** Programme of the Christian Radio Society (N.C.R.V.). **1.40,** Handicrafts Lesson. **2.40,** Gramophone Music. **3.10 to 3.40,** Interval. **3.40,** Religious Programme for Sailors with Smit Duyzentkunst (Baritone) and H. Smit Duyzentkunst (Organ). **4.40,** Handwork Lesson for Children. **5.10,** Concert by the Small N.C.R.V. Orchestra, conducted by van de Hurk: Two Pieces (Bach); Ja aan U heeft mijn ziel genoeg (von Brucken Fock); Melody (Siep); Op de Veluwe (Siep); Novelettes (Gade); My Old Kentucky Home (arr. Busch); Old Folks at Home (arr. Busch); Gramophone Music: Was Blumen träumen (Translateur); Overture, The Nuremberg Doll (Adam); Air varié (Vieuxtemps); Roses from the South (Johann Strauss). **6.40,** Police Notes. **6.55,** Gramophone Music. **7.10,** Press Review. **7.40** till Close Down, Programme of the Catholic Radio Society (K.R.O.). **7.40,** Acis et Galathée, Opera in Three Acts (Lully); The Concertgebouw Orchestra, conducted by Pierre Monteux; the Wagner Choir, conducted by den Hertog, and Soloists. **9.40** (approx.), News. **9.45,** Gramophone Music. **10.10,** L'heure Espagnole (Ravel), by the Concertgebouw Orchestra and Soloists, conductor, Pierre Monteux. **11.10,** Concert by the K.R.O. Boys. **11.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Notes, Racing Results and News. **8.10,** Scientific Review. **8.20,** Radio Concert. **9.0,** News and Weather. **9.15,** Literary and Musical Programme.

KALUNDBORG.—See **Copenhagen.**

KATOWICE

734 kc/s, 408 metres; 16 kW.—**6.5 p.m.,** Announcements and Gramophone Music. **6.10,** Sports Notes. **6.25,** Programme from **Warsaw. 9.15,** Gramophone Concert. **10.0** till Close Down, See **Warsaw.**

KAUNAS

155 kc/s. 1,935 metres; 7 kW.—**4.10 p.m.,** Quartet Concert: Souvenir (Renne); Berceuse (Godard); Polka; Lehár Potpourri. **4.40,** Talk. **5.0,** Talk on Religion. **5.20,** Gramophone Music. **5.40,** News Bulletin. **6.0** Time, Weather, News, Exchange, and Programme Announcements. **6.30,** Programme on the Fiftcenth Anniversary of the Lithuanian Independence. In the interval at **8.40** (approx.), Talk: The Battle of Grünwald in 1410. **9.30** (approx.), Close Down.

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**1.30 p.m.,** Talk: Programme of Work for 1934. **1.45,** Pianoforte Solo, An der schönen blauen Donau (Schulz-Elver), played by Hans Haass. **2.0,** Talk on the Düsseldorf Zoological Gardens. **2.30,** Economic Notes. **2.50,** Political Announcements. **3.0,** Variety Programme. Part I—Variety Music by the Fröhliehle Fünf: Waltz, Volga (Cassau); Ballet des Parfums (Popy); Tango, Satanella (Eysoldt); Foxtrot, Atlantic; Sehnsucht (Quackenberg); Potpourri of Popular Songs (Meisel). Part II—Gramophone Music, Anecdotes and Jokes. Part III—Military Music with Commentary. The Station Male Voice Choir and Wind Instrument Orchestra and Soloists. March, Friderieus Rex; Wer kennt nicht jenes Städtchen; Weisst du noch die schönen Maientage; Füseliers sind lustige Brüder; Alexander March; Lippe-Detmold eine wunderschöne Stadt; Des Gardisten Abschied; Was blinkt so freundlich in der Ferne; March, Lützows wilde Jagd; Brüder tretet in die Runde; Steinmetz March; Was zeiht dort? Wenn die Soldaten durch die Stadt marschieren. **5.0 to 5.35,** See **Stuttgart. 5.35,** Talk for Workers. **5.50,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Munich. 7.0 to 9.20,** See **Frankfurt. 9.20,** See **Munich. 9.45,** News, Weather and Sports Notes. **10.0,** Dance Music by the Station Dance Band, conducted by Kühn. **12 Midnight** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—11.0 a.m.,** Concert by the Leipzig Instrumental Quartet. **12.15 p.m.,** News. **12.30,** Gramophone Concert of Military Music. **1.15,** News. **1.30,** Film Review. **2.10,** Reading (Hermann von Pückler-Musakau). **2.35,** Market Prices. **3.0,** Programme to be announced. **4.0,** Concert of Folk Music, relayed from the Radio Exhibition. A Children's Bandonion Group, conducted by Winterstein, and a Children's Mouth Organ Ensemble. Part I—Bandonion Music: Wir gratulieren (Kahle); Abendständchen (Schiebold); Aennchen von Tharau (Silcher); Ländler, Klänge vom Königssee (Seifert). Part II—Mouth Organ Music: Two Folk Melodies: (a) Im schönsten Wiesengrunde, (b) Goldne Abendsonne; Die Mühle am Wiesenbach (Schmidt); Märkische Heide (Büchsenschütz). **5.0,** Military Programme. **5.25,** Topical Talk. **5.40,** Economic Notes and News. **6.0,** Transmission for all German Stations, relayed from **Munich. 7.10,** Preussengeist—Drama (Paul Ernst). **9.0,** News. **9.30,** Talk: Chemicals as Weapons of War. **10.0,** Dance Music from **Berlin (Funkstunde). 11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW. German Evening.—**7.0 p.m.,** Pianoforte Recital by Irma Laszlo: Gavotte and Variations (Rameau); Ballad in F minor, Op. 52 (Chopin); Toccata in C sharp minor (Debussy); Caprice in C, Op. 50, No. 3 (Moszkowsky); Concert Polka from E flat minor (Sauer); Concert Etude in F minor (Dohnanyi). **7.35,** Talk in German: The Furnishing of the Modern House. **7.50,** Concert of German Music by the Radio Orchestra, conducted by Henri Pensis; Soloist: Otto Muller (Flute): Overture, Manfred (Schumann); Selection from Hansel and Gretel (Humperdinck); Caprice for Flute and Orchestra (Kempter); Pictures from the Orient (Unger); Träume and Albumblätter (Wagner); Wotan's Farewell and Fire Magic from The Valkyrie (Wagner). **8.50,** News in French. **9.0,** Song Recital by Elisabeth Corty: Heimliche Liebe (Brahms); Die Soldatenbraut (Schumann); Komm wir wandeln zusammen im Mondschein (Cornelius); O Sonnenschein (Schumann); Heidenröslein (Schubert); Volksliedchen (Schumann); Untren (Cornelius); Letzte Rose (Flotow). **9.30,** Concert by the Radio Orchestra, conducted by Henri Pensis: Waltz, Dreaming (Joyce); Melody (Tchaikovsky); Servus du (Stolz); Ballet Music from Frau Luna (Lincke); Aufzug der Stadtwache (Jessel); Selection from Die Puppenfee (Bayer); The Clock is playing (Blaauw); March, Entry of the Gladiators (Fucik). In the interval at **9.50,** News in German. **10.25,** Dance Music on Gramophone Records.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.,** Literary Talk. **6.15,** Announcements. **6.25,** See **Warsaw. 6.45,** Sports Notes. **6.47 till Close Down,** See **Warsaw. 10.30** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Concert by Mme. Vallier Delcour (Songs), Gay (Violin), Mme. Palmero (Violin), Mlle. Laval (Viola) and Roumiantzev ('Cello): Sonata for Two Violins and Pianoforte (Handel); Viola Solos: Three Fairy Tales (Schumann); La bonne chanson (Fauré); Suite for Violin and 'Cello (Bazelair); Evensong (Wieniawsky); String Quintet (Schubert). After the Concert, News Bulletin.

MADRID

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Programme from **Madrid (Union Radio). 12 Midnight to 12.30 a.m. (Friday),** I.B.C. Concert: I am so anxious, dear (Gilbert); I may be wrong, but I think you're wonderful; Please; Beautiful Nice; Just like a story book; Selection from A Waltz Dream; Smile, darn yer, Smile **12.30,** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Announcements and Programme for Children. **8.15,** Radio Journal. **8.30 to 9.15,** Interval. **9.15,** English Lesson. **9.30,** Chimes, Time and Radio Journal. **9.45** (approx.), El Huerto Sin Flores—Play (Diego san Jose). **11.45,** Radio Journal. **12.0** Midnight, Chimes. **1.0 a.m. (Friday)** till Close Down, I.B.C. Programme of Dance Music: When we went strolling round the Town; Wild Goose Chase; When my Little Pomeranian; Blaze Away; Then the Moon came out; Lady, play your Mandoline; That's Georgia; At the Old Pig and Whistle; Sweet Dreams, Pretty Lady; I've got the World on a String; Sundown in a Little Green Hollow; But for you; From me to you; Lovey; Coal Black Mammy; Reflections in the Water. **2.0,** I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.30 p.m.,** German Transmission: Two Talks. **6.0,** See **Prague. 7.15,** Light Music by the Station Orchestra, conducted by Musil. **7.50,** See **Prague. 8.20,** See **Brno. 9.0,** See **Prague. 9.40** (approx.), Close Down.

MOSCOW

KOMINTERN, RW1, 202.5 kc/s, 1,481 metres; 500 kW.—**3.15 p.m.,** Musical Programme. **3.30,** Talk: Social Democrats. **4.30,** Red Army Programme. **5.30,** Collective Farms' Programme. **6.30,** Talk on National Economy. **7.0,** Beethoven Concert. **8.0,** Review of the Week, in German. **8.55,** Chimes from the Red Square. **9.5,** Review of the Week in French. **10.5,** Talk in Spanish: Soviet Law.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s. 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m.,** Concert from **Langenberg. 4.45,** Agricultural Talk. **5.5,** Early Works of Richard Strauss—Concert, conducted by Carl Orff. **5.25,** A Letter from South-West Africa. . . . **5.45,** Time, Weather, and Agricultural Notes. **6.0,** Transmission for all German Stations; Concert of Bavarian Folk Music by the Small Station Orchestra, conducted by Erich Kloss; the Station Choir, conducted by Eduard Zengerle; the Bavarian Schrammel Quartet; and Soloists. **7.5,** Concert by the Small Station Orchestra, conducted by Erish Kloss; Soloists, Martha Martensen (Soprano), Hugo Reker (Violin) and Georg Troibner ('Cello). **8.0,** Concert of Light Music. **9.0,** Austria. **9.20,** Monthly Review of World Politics. **9.45,** Time and News.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy LCL, 6,990 kc/s, 42.82 metres.—4.0 p.m.,** Concert by the Station Orchestra, conducted by Kramm: A Wedding Day on Troldhaugen (Grieg); Caucasian Suite No. 1 (Ippolitov-Ivanov); Pan (Liebich); Barcarolle (Liebich); Melody (Alfven); Arab Dance (Glazunov); Strofe (Bartholdy); Papillon (Godard); Humoresque (Lalo); Joh. Strauss and Lanner Waltz Potpourri (Melichar). **5.0,** German Lesson. **5.30,** Divine Service, relayed from **Bergen, 824 kc/s, 364 metres. 6.0,** Weather and News. **6.30,** Theatre Review. **7.0,** Time. **7.1,** Agricultural Talk. **7.30,** Violin and Pianoforte Recital by Trygve Christiansen and Petra Hendriksen: Rondo brillante, Op. 70 (Schubert); Lullaby (Barbelli); Sonata in D minor (Paganini); Sonata in D (Paganini). **8.0,** Recitations. **8.20,** Sponsored Concert. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Humorons Talk. **9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Agricultural Notes, and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Orchestral Concert. March, Arte italica (Bettinelli); Waltz, Guitarrina (Chapuis); Gavotte, Settecento (Fiorillo); Intermezzo, Zingaresca (Malvezzi); Serenade, Lolita (Buzzi-Peccia); Waltz, Violette di Parma (Cecucci); Tango, Un po' di fumo (Di Lazzaro); Baruffe trasteverine (Cardoni). **8.30,** One Act Comedy (Alvarez Quintero). **9.0,** Concert (cond.). Overture, Les Cloches de Corneville (Planquette); Selection from The Flower of Hawaii (Abraham); Baby spielt Soldat (Noack); Scusi, signora (Simi); Two Pieces (Mancini): (a) Viva l'Istituto di bellezza, (b) Ogni amore è una canzone; Marche des Midinettes (Billi). **10.0,** Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.15,** Weather. **7.25,** News. **7.30,** Gramophone Concert; Part I, Russian Music: Symphony (Borodin); Selection from Boris Godunov (Mussorgsky); Six Short Russian Pieces (Liadov); The Musical Snuff-Box (Liadov). **8.0,** Political Review. **8.15** (approx.), Gramophone Concert (contd.): Selection from Si j'étais roi (Adam); La croix du chemin (Goublier); Notre-Dame de Paris (Goublier); Selection from The Dubarry (Millöcker-Mackeben); Un soir de réveillon (Joyce); Valse du rêve (Joyce); Piece (Reggov); Melody (Henberger); Babillage (Gillet); Quadrille from La vie parisienne (Offenbach). **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Exchange. **7.5,** Agricultural Notes. **7.15,** Le Journal Parlé. **7.30,** Programme for Children. **8.0,** Sponsored Talk. **8.5,** Topical Talk. **8.35,** Sponsored Talk. **9.25,** Gala Concert. **10.30,** News.

PARIS

RADIO-PARIS; Call CFR; 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** Press Review and Weather. **12.0 Noon,** Protestant Address. **12.30 p.m.,** Gramophone Concert. Part I, Falla Music: Selection from The Three-cornered Hat; Extracts from El amor brujo Spanish Songs: (a) El pañn moruno, (b) Seguidilla murciana, (c) Asturiana; Concerto for Harpsichord, Flute, Oboe, Clarinet, Violin, and 'Cello. Part II, Light Music: Les Cloches de Vineta (Orth); Ah! le beau rève (Gauwin-Daras); S'aitner (Gabaroche); In a Clock Store (Orth); Tyrolienne

(Blangy); Santica (Guida); La bergère Celimène (arr. Cassadesus); L'Hermite (arr. Cassadesus); Fleur fanée (Legendre); El poso (Menichetti); Melody (Openshaw); Fête militaire (Sylvain). In the interval at 1.0, Exchange, News, and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.20, Talk, Weather, and Market Prices. 6.45, Legal Talk. 7.0, Dialogue. 7.20, Gramophone Music. 7.30, Light Music: Le chien du berger (Marceau); Dis-moi (Larrieu); Ca c'est tout le midi (Maye); Quand on s'en va (Borel-Clerc). 7.45, Review of the German Press, Commercial Notes, and News. 8.0, Rose, ma voisine—Opéra-comique (Marcelle Chadel). 8.40, Review by Bonnaud. 8.45, George Dandin—Play (Molière). In the intervals, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW.—Relayed by **W8XK** on **48.86 metres;** and **25.27 metres.—7.0 p.m.,** Happy Felton's Orchestra. 7.30, KDKA Home Forum. 7.45, Pioneers. 8.0, Words and Music, from **New York.** 8.30, Rhythmic Serenade, from **New York.** 8.45, Federation of Pennsylvania Women. 9.0, Betty and Bob, from **New York.** 9.15, Programme to be announced. 9.30, News and Market Reports. 9.45, Thursday Special, from **New York.** 10.0, Federation of Women's Clubs, from **New York.** 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from **New York.** 10.45, Orphan Annie, from **New York.** 11.0, News by Pat Haley. 11.15, Sports Notes and Programme Preview. 11.30, Evensong. 11.45, Lowell Thomas, from **New York. 12 Midnight,** Amos 'n' Andy, from **New York. 12.15 a.m. (Friday),** Marvellous Melodies. 12.30, Lois Miller, Organist. 12.45, Pathé News of the Air. 1.0 to 3.30, **New York** Relay. 1.0, Captain Diamond. 1.30, Adventures in Health. 1.45, The Revellers. 2.0, Death Valley Days. 2.30, Lady Esther Serenade. 3.0, Hands across the Border.

PORSGRUND.—See **Oslo.**

POZNAN

897 kc/s, 334.4 metres; 1.9 kW.—**6.0 p.m.,** Programme Announcements. 6.5, Miscellaneous Items. 6.25, See **Warsaw.** 6.40, Sports Notes. 6.47, See **Warsaw.** 9.0, Dance Music from the Esplanade Café. 10.0 (approx.), Close Down.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Brno.** 3.50, Programme for Children. 4.15, Talk for Workers: The Czecho-Slovak Glass Exhibition. 4.25, Gramophone Music. 4.35, Elementary French Lesson. 4.50, Gramophone Music. 5.5, Agricultural Talk: Bee-Keeping Notes. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Agricultural Programme. 6.0, Time, News and Weather. 6.10, Tourist Report. 7.10, See **Bratislava.** 7.50, Dramatic Programme: Scenes from St. Wenceslas—Play (Arnost Dvorak). 8.20, Folk Song Recital relayed from the Opera House. 9.0, Time, News, Review of the Day and Sports Notes. 9.15, Introductory Talk to the following Transmission. 9.20, Smetana Song Recital by Otakar Marak. 9.30 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.—6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from **Geneva**), Variety Items. 12 **Noon** (from **Lausanne**), Financial Notes. 12.10 **p.m.** (from **Lausanne**), Gramophone Concert. 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0 (from **Geneva**), Harpsichord and Flute Recital by Germaine Clerc and André Meschini, relayed from the Conservatoire: Gavotte for Harpsichord (Rameau); Sonata in E minor for Flute and Harpsichord (Handel); Piece (Byrd); Harpsichord Suite in E minor (Bach). 3.30 (from **Geneva**), Concert by the Radio-Suisse Romande Orchestra, conducted by Echenard: Overture, Le Nouveau Seigneur du village (Boieldieu); Ballet Music from La Source (Delibes); Two Pieces (Franck); Rapsodie sur des airs du pays d'Oc (Lacombe); La jota aragonesa (Saint-Saëns); Selection from Where the Lark Sings (Lehar); Marche nuptiale d'une poupée (Lecocq). 5.0 (from **Lausanne**), A Lesson in Saddle-Making. 5.30 (from **Lausanne**), Talk: The Thirteenth Centenary of the Abbey of Moutier-Grandval. 5.55 (from **Lausanne**), Tourist Report. 6.5 (from **Lausanne**), Theatre Talk. 6.30 (from **Lausanne**), Talk on the Dairy Industry. 6.59 (from **Lausanne**), Weather Report. 7.0 (from **Lausanne**), Carlo Boller Song Recital by the Colombière Choir, of Nyon, conducted by the Composer. 7.45, Concert by the Radio-Suisse Romande Orchestra, conducted by Echenard: Soloist: Lydia Korotneff (Songs); Selection from A Life for the Czar (Glinka); Ballet Music from Raymonda (Glazunov); Songs: (a) The Lark (Glinka), (b) Hindu Song (Rimsky-Korsakov); Prelude to Khovanstchina (Mussorgsky); Dance from Prince Igor (Borodin); Song (Mussorgsky); Polonaise and Waltz from Eugene Onegin (Tchaikovsky);

NOV. 23rd THURSDAY *continued*

March from The Golden Cockerel (Rimsky-Korsakov). 9.0, News and Weather. 9.15 (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

CALL 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.**; and **2RO, 11,810 kc/s, 25.4 metres.—12.10 to 1.15 p.m.,** Concert from **Turin.** In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. 3.30, Children's Radio Review. 3.50, Giornale Radio and Exchange. 4.0, Reading. 4.10, Weather. 4.15, Song and Pianoforte Recital. Gigliola Galli (Pianoforte), Margherita Cossa (Soprano), and Guglielmo Castello (Baritone); Romanian Dances (Bela-Bartok); Soprano Solos: (a) Canzoncina bolognese (Gedda), (b) Armonieveneziane (Rosselini); Baritone Solos: (a) Aria from Faust (Gounod), (b) Aria from William Ratcliff (Mascagni); Pianoforte Solos: (a) Prelude (Chopin), (b) Humoresque (Rachmaninov); Soprano Solos: (a) Aria from Melenis (Zandonai), (b) Una ruota si fu in cielo (Persico). 5.0, Talk: The Catacombs. 5.40 **(Naples),** Shipping and Sports Notes. 5.45, Dopolavoro Report and Tourist Notes. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Song Recital by Sandro Lavagno (Tenor). 7.30, Giornale Radio and Sports Notes. 7.45, Talk on Literature and Art. 8.0, Concert. Luisa Carlevarini (Violin), Renato Josi (Pianoforte), and Emilio Livi (Tenor); Sonata in D for Violin and Pianoforte (Nardini); Songs; Violin Solos: (a) Caprice (Kreisler), (b) Hopak (Mussorgsky-Dushkin). 9.0, Le arance della contessa—Play in One Act (Gherardi Del Testa). After the Play, Gramophone Records of Russian Songs by the Don Cossack Choir, Italian Music and Dance Music. 10.0, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.—12.45 a.m. (Friday),** Stock Reports. 1.0 to 4.0, **New York** Relay. 1.0, Variety Programme. 2.0, Captain Henry's Show Boat. 3.0, Al Jolson; Paul Whiteman's Orchestra. 4.0, Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m.,** Gymnastics. 11.0 (from **Zurich**). Programme for Housewives. 11.5 (from **Zürich**), Concert by the Small Station Orchestra, conducted by Scherbaum. 12.25 **p.m.** (from **Zürich**), Time, Weather and Exchange. 12.30 (approx.), Interval. 2.30 (from **Berne**), Gramophone Concert. 2.59, Time Signal from Neuchâtel Observatory. 3.0, See **Radio-Suisse Romande.** 5.0 (from **Basle**), Songs and Harp Solos on Gramophone Records. 5.30 (from **Basle**), Poetry Reading. 6.0 (from **Basle**). Time, Weather and Traffic Report. 6.5 (from **Basle**), Debussy Recital by Gerty Siebenmann (Soprano), and Marcel Sulzberger (Pianoforte). 6.35 (from **Basle**), Swiss Music on Gramophone Records. 7.0, Medical Talk. 7.30, Concert by the Station Orchestra, conducted by Neppach. 8.0, Weather and News. 8.10 (from **Basle**), Chamber Music. 9.15 (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.—1.45 to 2.10 p.m.,** Broadcast for Schools, relayed from **Malmö, 1,301 kc/s, 230.6 metres.** 4.5, Divine Service, relayed from **Malmö.** 4.30, Programme for Children. 4.45, Gramophone Music. 5.45, Elementary English Lesson. 6.15, Weather and News. 6.30 (from **Göteborg**), Talk. 6.55, Richard Tauber Song Recital (on Gramophone Records). 7.10, Gustav III—Play (August Strindberg). 8.45, Weather and News. 9.0, Light Music by the Septiman String Ensemble: Piece (Ippolitov-Ivanov); Kaiserwalzer (Joh. Strauss); Chant sans Paroles (Tchaikovsky); Two Pieces (Syögren); Piece (Alfvén); Ritmi (Castelnuovo-Tedesco); Lullaby (Ek); Dance (Trobäck); Pieces (arr. Sköld); Serenade (Gyldmark); Waltz from New Moon (Romberg). 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Gramophone Concert of Variety Music. **12.45 p.m.,** News. 1.0, Time and Exchange. 1.5, Orchestral Concert conducted by Maurice de Villers. 2.0, Programme for Children. 3.0, Interval. 3.45, French Elocution Lesson. 4.0, Programme for Children, relayed from **Bordeaux Lafayette.** 6.0, Literary Talk in German: Jean Nestroy, the Austrian Molière. 6.15, Talk: Women's Part in National Defence. 6.30, Light Music conducted by Roskam. March, Eyes Right (McKnight); Boston, Dis-moi, Darling; Overture, Nakiris Hochzeit (Lincke); Nobody's waiting (Burns); Tango (Mariotti); Selection from The Maid of the Black Forest (Jessel); Vacances d'amour (Fylling); Can't we meet again (Flanagan and Connell); Violin Solo: Liebesleid (Kreisler); Aubade japonaise (Lachaume); Miss Elizabeth Brown (Gay); Two Step, Micaella (de Bozi). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Concert by the Union Music Society, relayed from Colmar. Concert Overture, Wilhelmina (Boyer); Scènes pittoresques (Massenet); Selection from La belle Hélène (Offenbach); Au pays basque (Fernand); Florentine March (Fucik). In an interval at 9.30 (approx.), Talk: The Fight against Tuberculosis. 10.30 (approx.), Press Review.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.—12.35 p.m.,** See **Frankfurt.** 2.0, Programme for Young People. 3.0, See **Langenberg.** 5.0, Spanish Lesson. 5.20, Natural History Talk: Animals in Winter. 5.35, Talk. 5.50, Time and Weather. 6.0, Transmission for all German Stations, relayed from **Munich.** 7.0 to 9.20, See **Frankfurt.** 9.20, Things you should know. . . . 9.30, News. 9.45, Gramophone Music. 10.0 **till Close Down,** See **Langenberg. 12 Midnight** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. 6.15, Music by a Viennese Orchestra. 6.30, Programme for Children. 7.0, Accordion Solos. 7.15, News. 7.30, Pianoforte Recital. Polonaise (Chopin-Liszt); The Harmonious Blacksmith (Handel); El puerto (Albeniz); German Dance (Schubert). 7.45, Chansonnettes. 8.0, Orchestral Music: Wedding March (Rimsky-Korsakov); Rhine March (Frantzen); Minuet from Le Bourgeois Gentilhomme (Lully-R. Strauss); March (Meyerbeer). 8.15, Opera Music: Prayer from Rigoletto (Verdi); Werther's Aria from Werther (Massenet); Aria from Le bon roi Dagobert (Rousseau). 8.30, Operetta Music. Aria from Die Teresina (O. Straus); Selection from Véronique (Messager); Aria from Kadubeck (Yvain). 8.45, Extracts from Sound-Films. 9.0, Concert Version of Frasquita—Operetta (Lehár). 9.30, Light Music. 9.45, Concert. Part I: Songs. Part II: Opera Music: Selection from La Bohème (Puccini); Selection from La dame blanche (Boildieu); Aria from Ramwatcho (Pierné). 10.15, News. 10.30, Programme for Listeners in Morocco. Part I: Operetta Music: Arias from: (a) Miss Decima (Audran), (b) Mam'zelle Nitouche (Hervé); Duet from Passionnément (Messager); Aria from Oh, Papa (Yvain). Part II: Orchestral Music. 11.0, Chansonnettes. 11.15, Dance Music. **12 Midnight,** News. **12.5 a.m. (Friday),** Accordion Solos. 12.15, Music by an Argentine Band. 12.30 (approx.), Close Down.

TRIESTE

1,221 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—4.10 p.m.,** Gramophone Concert of Chamber Music. Overture, The Ruins of Athens (Beethoven); Nocturne No. 2 (Debussy); Italian Caprice (Tchaikovsky); Hungarian Rhapsody No. 12 (Liszt); Serenata napoletana (Sgambati); Andalusian Romance (Sarasate); Symphonic Poem, Psyché (Franck). 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Report and Gramophone Music. 6.0, Time, Tourist Report and Gramophone Records. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, News, Weather and Gramophone Music. 7.25, Talk on the following transmission. 7.30, An Opera (to be announced). In the intervals, Talk, Literary Notes and Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in French. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m.,** Orchestral Concert, conducted by Rudolf Pehm. Overture, Czar and Carpenter (Lortzing); Legende (Dvorak); Waltz, So tanzt man in Wien (Pausperti); Overture, Mitternachtssonne (Pehm); Selection from The Queen of Spades (Tchaikovsky); Spanish Dances (Moszkowsky); Song and Coronation March from Die Folkunger (Kretschmar); Albumblatt (Wagner); Schatzwalzer (Joh. Strauss); March, Auf nach Sievering (Lilienau). In an interval at 10.55, Weather. 12 **Noon,** Time and News. 12.10 **p.m.,** Gramophone Concert. 1.0, Interval. 2.0, Time and Announcements. 2.30, Talk: Increasing Egg Production by Means of Artificial Lighting. 2.30, Programme for Children. 2.55, Gramophone Concert of Music from Sound Films. 3.20, Talk. 3.40, Talk for Women. 4.0, Autumn—Song and Duet Recital by Edith van Aust (Mezzo-Soprano), and Hans Peterka (Baritone). Baritone Solos: (a) Herbststurm (Grieg), (b) Herbststimmung (Grieg), (c) Uber die Haide (Fischhoff), (d) Oktober (Kornauth), (e) Song (Rinaldini), (f) Allerseelen (R. Strauss); Mezzo-Soprano Solos: (a) Ach, wie so schnell (Mendelssohn), (b) Herbst (Mittler), (c) Love Song (Rinaldini), (d) Herbstbeginn (Wetchy), (e) An einen Herbstwald (Josef Marx); Duets (Mendelssohn): (a) Abschied der Zugvögel (b) Ach, wie so bald. 4.40, Technical Talk. 4.55, Talk: Customs and Abuses of the Guild System. 5.20, Talk: Juvenile Rescue Work in Austria. 5.45, Theatre Review. 5.50, Time and Announcements. 6.0, Concert of Sacred Music, relayed from the University Church. The State Opera House Choir, conducted by Ferdinand Grossmann. Soloists: Enid Szantho (Contralto), Josef Manowarda (Bass), and Karl Walter (Organ). 7.0, La Cenerentola—Opera (Rossini), relayed from the State Opera House. In an interval at 8.20 (approx.). News. 9.25, Dance Music by the Ferry Hyde Band, relayed from the Café Palmhof. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Gramophone Music. 11.30, Radio Journal. 11.35, Concert of Polish Music by the Warsaw Philharmonic Orchestra, conducted by Wilkomirski. Soloists: Mms. Lozinska (Songs), Szretter (Soprano), and Hoffman (Mezzo-Soprano). Introductory Talk; Overture, Halka (Moniuszko); Two Pieces for String Orchestra (Karlowicz): (a) Romance, (b) Waltz from the Serenade; Vocal Trio: Au clair de la lune (Karlowicz); Vocal Duet: On the Hill (Maszynski); Vocal Trio (Pankiewicz); Songs: (a) To the Sorrowful One (Karlowicz), (b) Spring (Maszynski), (c) La Fileuse (Moniuszko); Extracts from the Suite (Maliszewski); Peasant Dance (Wronski); Mazurka (Lewandowski). 1.0 **p.m.,** Weather Report. 1.3, Interval. 2.30, Economic Notes. 2.40, Recital on Two Pianofortes by Walentynowicz and Bukin: Prelude and Fugue (Tarenghi); Impression (Turski); Romantic Piece, Op. 9 (Chaminade); Arabesque No. 2 (Debussy); Suite No. 3 (Arenski). 3.25, Schindler Songs on Gramophone Records. 3.40, Talk for Women. 3.55, Duets by Marwid (Soprano) and Czechowicz (Contralto). 4.20, Violin Recital by Jean Dworakowski: Concert Sonata in E Minor (Veracini); Scottish Dances (Tor Aulin); Air (Zipoli); Presto No. 6 (Abaco); La Précieuse (Couperin-Kreisler); Scherzo (Dittersdorf-Kreisler). 4.50, Agricultural Notes. 5.0, Talk. 5.20, Dramatic Programme. 6.0, Programme Announcements. 6.5, Miscellaneous Items. 6.25, Topical Talk. 6.40, Sports Notes. 6.47, Radio Journal. 7.0, Light Music by the Station Orchestra, conducted by Nawrot. Soloist: Mierzejewski (Songs), Selection from Prince Methuselah (Joh. Strauss); Three Songs; Oriental Dance (Siede); Waltz, Christine (Gottler); Slow Foxtrot (Stark-Gyulai); Songs; Overture, Der Opernball (Heuberger); Album Leaf (Gyldmark); March (Jessel). 8.0, Answers to Correspondence. 8.15, Flute and Soprano Recital of Indian Music, arranged by M. Beelard-D'Harcourt, with Introductory Talk. 9.0, Gramophone Music. 10.0, Aviation Weather Report and Police Notes. 10.5, Gramophone Music (contd.).

WILNO

530 kc/s, 566 metres; 16 kW.—**6.25 p.m.,** See **Warsaw.** 6.45, Miscellaneous Announcements. 6.47, See **Warsaw.** 9.15, Dance Music on Gramophone Records. 10.0, See **Warsaw.** 10.30 (approx.), Close Down.

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—**6.10 p.m.,** Announcements. 6.40, Talk on Economics. 7.0, Programme from **Belgrade.** 9.0, News, Weather and Announcements. 9.15, Concert by a Russian Choir and a Balalaika Orchestra. 10.0 (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender.**

FRIDAY

NOVEMBER THE TWENTY-FOURTH

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.** **1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gardening Talk. **7.15,** Literary and Dramatic Talk. **7.30,** Time Signal. **7.31,** The Station Orchestra. **8.0,** Song Recital by Mr. and Mrs. P. J. Duffy. **8.15,** The Station Orchestra. **8.30,** Songs (contd.). **8.45,** A Drama, by The Mystics. **9.15,** Traditional Fiddle Solos by P. J. O'Reilly. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert: Selection from Chu-Chin-Chow (Norton); Wayside Rose from Frederica (Lehar); Alice Blue Gown, from Irene (Tierney); The Merry Widow Waltz (Lehar); A Bachelor Gay, from The Maid of the Mountains (Fraser-Simson); Yip-I-addy-I-ay, from Our Miss Gibbs (Flynn); You're the Cream in my Coffee, from Hold Everything (de Sylva); Selection from The Belle of New York (Kerker). **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd. Dance Music: I cover the Waterfront; Take me in your arms; Everyone says I Love You; Racing Commentary; The Last Round Up; Lyin' in the Hay; I couldn't tell them what to do; The Grandfather Clock. **10.30,** I.B.C. Good-night Melody, followed by News and Weather. **10.40,** Irish Dance Music by the Round Tower Ceilidhe Band. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Overture, Der Freischütz (Weber); Romance from the Violin Concerto (Lalo); Le Coucou (Daquin); Pastoral (Lovreglio); Wedding Day on Troldhaugen (Grieg); Minuet from the Symphony in E flat (Haydn); Selection from Herodiade (Massenet). **7.0,** Request Gramophone Records. **7.30,** Exchange and Gramophone Records (contd.). **8.0,** Gramophone Music. **8.30,** Catalan Educational Programme: Geography and History Lessons. **9.0,** Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. **9.10,** Music by the Radio Orchestra. **9.20,** Jazz Music. **10.0,** Vincente Diez de Trejada reads from his own Works. **10.20** (approx.), Quintet Music, relayed from the Café Vienés. In the interval at **11.0,** News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**11.30 a.m.,** Quintet Concert. **12 Noon to 7.0 p.m.,** See **Rome.** **7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

697 kc/s, 430.4 metres; 2.5 kW.—**6.0 p.m.,** Concert by the Station Orchestra. **7.0,** Programme relayed from **Zagreb, 977 kc/s, 307 metres.** **9.0,** Time and News. **9.5** (approx.), Cigány Music, relayed from the Roducanin Restaurant.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**12.45 p.m.,** News. **1.0,** Gramophone Concert: Selection from L'Arlésienne (Bizet); Hungarian Dances Nos. 5 and 6 (Brahms); Extract from the Bulgarian Suite (Vladigerov); Hymn to the Sun, from Iris (Mascagni); Hungarian March (Berlioz); Waltz, Morgenblätter (Strauss). **2.0,** Talk for Girls. **2.30,** Weather and Exchange. **2.45,** Reading. **3.0,** See **Leipzig.** **4.0,** Talk on Education. **4.20,** Concert by the Wilfred Kruger Orchestra: Minuet in F (Haydn); Chanson triste (Tchaikovsky); Wiegenlied (Reger); Selection from La Bohème (Puccini); Hungarian Autumn Song (Kaesok); Melody (Rachmaninov); Valse triste (Sibelius); Träume (Wagner); Spanish Dance (Granados. **5.0,** Poems. **5.5,** Concert (contd.): Mozart Potpourri; Berceuse (Järnefeldt); Angelus (Debussy); Murmelndes Lüftchen (Jensen); Simple Aveu (Thomé). **5.25,** Wolfgang Hermann reads from his own Book. **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations: Concert by the Berlin Philharmonic Orchestra, conducted by Edwin Lindner: Symphony No. 2 (Brahms); Symphonic Poem, Till Eulenspiegel's Merry Pranks (R. Strauss). **7.0,** Pianoforte Concerto in E Minor, Op. 11 (Chopin), played by Mitja Nikisch and the Berlin Philharmonic Orchestra. **7.30,** Liszt Recital by Mitja Nikisch (Pianoforte). **8.0,** Ingeborg—Comedy (Goetz), with Music by Jentsch. **9.0,** News and Sports Notes. **9.15,** Talk: The Technical Tasks of the Wireless Association. **9.45,** Weather. **10.0,** See **Langenberg.** **11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB** and **DJE.**—**6.0 p.m.,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **7.5,** Concert of Music by Mark Lothar and Georg Vollerthun. The Berlin Station Orchestra. Soloists: Gertrud Callam (Soprano), Gerda Heuer (Soprano) and Rio Kube (Tenor). Part I: Mark Lothar Music, conducted by the Composer: Tylls Heimkehr from Tyll; Song and Duet from Tyll; Folk Dance; Monologue, Song and Duettino from Tyll; Small Orchestra: Suite from a Children's Fairy Play; Overture to and Selection from Lord Spleen. Part II: Georg Vollerthun Music, conducted by the Composer: Fourth Song Cycle for Soprano and Orchestra: (a) Elfkönig, (b) Die Mutter singt, (c) Ich; Four Songs for Soprano and Chamber Orchestra: (a) Die Wünsche, (b) Der Esel, (c) Heimliches Ständchen, (d) Zweifel; Symphonic Suite from Der Freikorporal. **9.0,** Weather and News. **9.15,** See **Berlin (Deutschlandsender).** **9.45,** Light Music. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News. **7.40,** Gramophone Music. **7.55,** Lottery Results. **8.0,** Spanish Lesson. **8.15,** News. **8.30,** Concert relayed from the Théâtre des Champs Elysées, **Paris.**

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—**6.25 p.m.,** Concert of Light Music by the Station Orchestra. **7.10,** The History of the Castle of Vrsatec—Play in Three Acts. **9.10,** See **Prague.** **9.40** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**12.45 p.m.,** Time and News. **1.10,** Gramophone Concert: Comedy Overture (Kéler-Béla); Selection from Tiefland (d'Albert); Lagunenwalzer (Joh. Strauss); Hungarian Melodies; Spanish Dance, No. 6 (Granados); Entr'acte Gavotte from Mignon (Thomas); Bombardonmarsch (Krahl). **1.40,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices. **2.35,** Programme for Young People. **3.0,** Concert by the Station Orchestra, conducted by Ernst Topitz. Soloist: Bruno Janz (Violin). March, Unter dem Freiheits-Bannner (Pöhler); Overture, Fahrend Volk (Leuschner); Selection from Prince Methuselah (Joh. Strauss); Violin Solo; Serenade (Lehár); Fantasia, Hungaria (Leopold); Diavoletta (Lindemann); Waltz, Nordseebilder (Joh. Strauss); Gallop, Feuerfest (Jos. Strauss). In the intervals: Reading from the Works of Charles Dickens and Agricultural Prices. **5.0,** A Dialogue for Would-be Housewives. **5.20,** Programme to be announced. **5.40,** Programme Announcements and Meat Market Prices. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender).** **7.0,** News. **7.5,** Introductory Talk to the following Transmission. **7.10,** Così fan tutte Opera in Two Acts (Mozart), relayed from the Municipal Theatre. In the interval at **8.20,** Time and News. **9.15,** See **Berlin (Deutchlandsender).** **10.0,** Old Songs and New Dance Music on Gramophone Records. **11.0,** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News and Talk on Chemistry. **6.0,** See **Prague.** **6.25,** See **Bratislava.** **7.10,** Literary and Musical Programme, relayed from the Masaryk University. **7.45,** The First Balloon Journey One Hundred and Fifty Years ago—Radio Sequence. **8.35,** Sonata in A, Op. 69 (Beethoven), for 'Cello and Pianoforte, by Krenek and Provaznik. **9.0,** Gramophone Music. **9.10,** See **Prague.** **9.40** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert of Italian Music by the Small Station Orchestra, conducted by Leemans: Overture, The Italian Girl in Algiers (Rossini); Petite Suite (Chaminade); La Pendula harmoniosa for Celesta and String Quartet (Pick-Mangiagalli); Selection from La Traviata (Verdi); Violin Solo: Minuet (Porpora-Kreisler); Consuelo (Culotta-Illuminato); Flor d'Andalusia (Pennati-Malvezzi); Selection from Cavalleria rusticana (Mascagni); Two-Step, Paso flamenco (Rossi). **1.0 p.m.,** Le Journal Parlé. **1.10,** Winter—Gramophone Concert: Winter from the Seasons (Glaznov); Des pas sur la Neige (Debussy); Le Neige, from Le poème de la Maison (Witkowsky); Troika; Two Songs; Waltz, The Skaters (Waldteufel); Les pieds dans l'eau (Mireille); Brise argentine (Daquin); Waltz, Wintersturme (Fucik). In the interval, Recitations. **5.0,** Concert by the Station Symphony Orchestra, conducted by Meulemans: Overture, Fingal's Cave (Mendelssohn); Suite, The Children's Corner (Debussy); The Moldau (Smetana); Nocturne (d'Augrèves); Waltz, Amoroso (Jehin); March from The Prophet (Meyerbeer). **6.0,** Talk on Motor Cars. **6.15,** The Pathetic Sonata (Beethoven) on Gramophone Records. **6.30,** Chimes—Concert by the Small Station Orchestra, conducted by Leemans: Rubens March (Benoit); Campana a sera (Billi); The Clock and the Dresden Figures (Ketelbey); Selection from Les Cloches le Corneville (Planquette); Carillon Prelude in E (Rachmaninov); The Old Musical Clock (Muller-Melborn); Tango, Bells of Valparaiso (Novno); Carillon (Elgar). **7.15,** Talk: Electro-Dynamics. **7.30,** Legal Talk, followed by Literary Review. **8.0,** Military Programme with Music by the Station Symphony Orchestra. **9.0,** Concert by the Station Symphony Orchestra, conducted by Meulemans: Dances from Prince Igor (Borodin); Valses nobles et sentimentales (Ravel); Slav Dance from Le roi malgré lui (Chabrier); Song: La fiancée du timbalier (Saint-Saëns); Dance of the Hours from La Gioconda (Ponchielli); Slav Dance No. 5 (Dvorák). **10.0,** Le Journal Parlé. **10.10,** La Brabançonne.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW.—Programme in Flemish. **12 Noon,** Gramophone Concert: Merrymakers' Dance (German); Chanson triste (Tchaikovsky); Love, your spell is everywhere (Janis); Perpetuum mobile (Ries); Vidalita (Pallemaerts); Aubade (Lischakov); Barn Dance (Lutz); Polka (Grossmith); La voix des cloches (Luigini); Pagan Love Song (Freed and Brown); Heartless (Meisel); What more can I ask? (Noble); Potpourri from He wanted Adventure (Warren Tonbridge); Hilda (Reynand); Potpourri (Kern); March, King Cotton (Sousa). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Lysistrata (Lincke); Serenade, May Time (Sykes); Andalusian Serenade, The Blue Pavilion (Armandola); Bohemian Dance from The Fair Maid of Perth (Bizet); Selection from The Grand Duchess of Gérolstein (Offenbach); Spanish Dance for Pianoforte (d'Agrèves); Waltz, Ton cœur (Jacobs); Selection from Un rêve blond (Heymann). **5.0,** Dance Music relayed from the St. Sauveur Palais de Danse. **6.15,** Talk: Ex-Prisoners of War. **6.30,** Violin and Pianoforte Sonata Recital by Saenen and Van Dommelen: Violin and Pianoforte Sonata in A minor (Schumann); Violin and Pianoforte Sonata (Milhaud). **7.0,** Gramophone Music: Leonora Overture No. 1 (Beethoven); Ballet Music from La Péri (Dukas). **7.30,** Wireless Notes. **8.0,** Dramatic Programme. **8.45,** Lalo Music on Gramophone Records: Finale from the 'Cello Concerto; Norwegian Rhapsody. **9.30,** Dance Music from the Hotel Plaza. **10.0,** Le Journal Parlé.

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Concert of Romanian Music by the Fanica Luca Orchestra. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.40,** Talk. **7.0,** Song Recital by Mme. Tinca-Mihalovici: Song (Handel); Ständchen (Schubert); La procession (Franck); Aria from Madame Butterfly (Puccini); Song (Bredicceanu). **7.20,** Concert by the Station Orchestra: Overture, Lodoiska (Cherubini); Danse macabre (Saint-Saëns); Polovtsian Dances from Prince Igor (Borodin); Humoresque (Vreuls); Waltz (Moszkowsky); Stolz Potpourri (Dostal). In the interval at **8.0,** Talk. **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **6.45 p.m.** till Close Down. —**4.0 p.m.,** Concert by an Orchestra of Unemployed Musicians, conducted by Molles. **5.40,** Gramophone Concert. **6.10,** Political Review. **6.30,** Relay from the Royal Hungarian Opera House. In the intervals, News, After the Relay, Music by a Cigány Band relayed from the Ketter Restaurant. **10.20,** Pianoforte Recital by Andreas Földos: Variations, Op. 24 (Brahms-Handel); Nocturne in C minor, Op. 48, No. 1 (Chopin); Etude in E flat, Paganini (Liszt); Winterreigen (Dohnányi); Triana (Albeniz).

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,667 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY.**—**11.0 a.m.,** Time and Chimes from the Town Hall. **11.5** (approx.), String Ensemble Concert, relayed from the Bellevue Strand-Hotel. **1.0 p.m.,** Interval. **2.0,** Concert by the Radio Harmony Orchestra, conducted by Launy Gröndahl. Soloist: Herman Jensen (Violin). Polonaise No. 2 (Liszt); Overture, The Grand Mogul (Audran); Flora Polka (Lumbye); Bolero from La chanson de Fortunio (Offenbach); Moorish March (Moszkowski); Violin Solos: (a) Spanish Dance (Granados-Kreisler), (b) Andante cantabile from the Concerto in D (Mozart), (c) Andalusian Romance (Sarasate); Festival Overture (Store); Extracts from Der Geist der Voyevode (Grossmann); Waltz, Amelia (Lumbye); Rhapsody, España (Chabrier); March and Waltz from The Golden Cross (Brüll); Overture, The King's Lieutenant (Titl). **4.0,** Programme for Children. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: Danish Ovens. **5.15,** German Lesson for Beginners. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.16,** Reading. **6.30,** Talk: Some Free-Church Communities in Denmark. **7.0,** Time from the Town Hall. **7.2** (approx.), Programme by Per Knutzon. **7.10,** Modern Melodies by the Kardosch Singers. **8.10,** Blow, Bugle, blow—Radio Play in One Act (Munsmann). **9.0,** News. **9.15,** Italian Music on Gramophone Records: Aria from Lucia di Lammermoor (Donizetti); Polonaise from Mignon (Thomas); Aria from The Daughter of the Regiment (Donizetti). **9.30,** German Chamber Music for Wind Instruments; Partita from the Lustige Feldmusik, for Flute, Oboe, Clarinet, Horn, Bassoon and Harpsichord (Krieger); Kleine Kammermusik, Op. 24, No. 2, for Flute, Oboe, Clarinet, Horn, Bassoon and Harpsichord (Hindemith). **10.10,** Dance Music by the Teddy Petersen Band, relayed from the Wivex Restaurant. **11.0,** Time and Chimes from the Town Hall.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I, Orchestral Concert: Signature Tune; Persian March (Friml); A Radio Roundabout (Noack); Pianoforte Solo: Waltz Time Medley (Strauss); The Way to the Heart (Lincke); The Clatter of the Clogs (Flynn); My Hero, from The Chocolate Soldier (O. Straus); The Cuckoo Song (Norton); Selection from The Quaker Girl (Monckton). Part II, Dance Music: Let's call it a Day; My Gipsy Rhapsody; From Me to You; It was a Night in June; Don't Blame Me; Egypt; Blue Cloud; Cornflowers and Poppies; Signature Tune. **12.0 to 3.30,** Programme in French. **3.30 to 6.0,** Programme in English by the I.B.C. **3.30** Organ Recital: Nola (Arndt); There's something about a Soldier (Gay); Serenade (Drigo); Bouncing Ball (Wark); Butterflies in the Rain (Myers); Bird Songs at Eventide (Coates); Weymouth Chimes (Howgill); The Wooden Soldier and the China Doll (Jones). **4.0,** Gramophone Concert: Destiny Waltz (Baynes); Valse des fleurs (Tchaikovsky); When Yuba plays the Rumba; Black Moonlight; Flittering Birds; The Grass is getting Greener; Sam's Medal; Selection from Give Me a Ring (Broones). **4.30,** The I.B.C. Nursery Corner with Columnus and Belinda; Birthday Greetings. **4.40,** Southampton and Winchester Orchestral Concert: Signature Tune. The Night by the Sea; Whispering Flowers (von Blon); Pianoforte Solo: Still I Love Her (Gaskill); The Golden Musical Box (Krome); Pianoforte Solo: Roumanian (Holbrooke); El Relicario (Padilla); The Musical Clock of Madame Pompadour (Noack); Selection from The Student Prince (Romberg); Wood Violets (Fétras); The Match Parade (Wehle); The Valley of the Poppies (Ancliffe). **5.20,** Bournemouth and Weymouth Concert of Military Music: New Colonial March; A Frangesa (Costa); Selection from San Toy (Monckton); Selection of Regimental Marches; In a Persian Market (Ketelbey); A Birthday Serenade (Lincke); Cornet Solo: I Hear You Calling Me (Marshall); Jolly Fellows (Vollstedt); Irish Jigs and Reels; Wood Nymphs (Coates); Hobomoko (Reeves); Signature Tune. **6.0 to 10.0,** Programme in French. **10.0** till Close Down. Programme in English by the I.B.C. **10.0** (approx.), Orchestral Concert: Once on the Rhine (Ostermann); Spanish Gipsy Dance (Marquia); Kashmiri Song (Woodforde-Finden); Ke-sa-Ko (Chapmni); Cœur brisé (Gillet); Woodland Peace (Favilla); Song: She is far from the Land (Ball); Babes in Toyland (Herbert). **10.30,** Dance Music: Signature Tune, Bells of Normandy; Lay your Head on my Shoulder; Sophisticated Lady; Aloha Oe; Happy Ending; Don't Blame Me; Trouble in Paradise; Cecilia Mia; Gipsy Sing for Me; Signature Tune. **11.0,** Talkie Time: Signature Tune, Sittin' in the Dark; Selection from Music in the Air; Live, Love and Laugh; Smilin' through; Hits from Forty Second Street; Let me give my happiness to you; Sweetheart Darlin'; I always keep my Girl out late; Heaven will protect an Honest Girl; Signature Tune. **11.30,** Club Concert for Coventry Listeners. Part I, Orchestral Concert: Signature Tune, The Chum Song; Rakoczy March (Berlioz); Solveig's Song from Peer Gynt (Grieg); Selection from I Pagliacci (Leoncavallo); Violin Solo: Fandango (Godawski); Waltz Song from La Bohème

(Puccini); Liebestraum (Liszt); Violin Solo: Hungarian Dance No. 5 (Brahms); Waltz from The Sleeping Beauty (Tchaikovsky). **12.5 a.m. (Saturday),** Late News Bulletin in English. **12.10** (approx.), Club Concert, Part II: Down in the Valley (Harrington); Tick, Tock (Vienna); Love Songs of the Nile (Freed); Sweep (Furber); Stay out of my Dreams (Washington); Signature Tune. **12.30,** Dance Music: Learn to Croon; I Wish I had Wings; Throw Open Wide your Window; Nina; Dinner at Eight; Ninon; Sweet Dreams, Pretty Lady; Sing another Line. **1.0,** Dance Music: Signature Tune, The Bells of Normandy; Whistling under the Moon; Elvira; Oh Johanna; Goodnight little Girl of my Dreams; The Wedding of Mr. Mickey Mouse; Ranno de la Noche; It's the Talk of the Town; I've found the Right Girl; If you'll say Yes Chérie; Everyone loves my Marguerite; Try a little Tenderness; Zigeuner, you have stolen my Heart; Let's make up; Ding, Dong, Ding; Cornflowers and Poppies; Avalon; Signature Tune, The Bells of Normandy. **2.0,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** Concert of Opera Music (on Gramophone Records): Extracts from Fidelio (Beethoven), The Barber of Seville (Rossini), La Traviata (Verdi), Tannhäuser (Wagner), Carmen (Bizet) and Madame Butterfly (Puccini). **1.40,** Talk for the Housewife. **2.30,** Sports Report and Weather Forecast. **2.40,** Time and Market Prices. **3.0,** Concert. **5.0 to 5.35,** See **Langenberg.** **5.35,** Talk: The Need of Economic Propaganda. **5.50,** News, Announcements and Time. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Stuttgart. 9.30,** Time and News. **9.45,** Local News and Weather. **10.0,** See **Langenberg. 11.15,** Talk: The Classic Element in German Music. **11.45** (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg;** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—**6.0 p.m.,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0** (from **Hanover**), Concert of Waltzes, Polkas, and Czardas. The Hanover Station Orchestra, conducted by Ebel von Sosen. Soloists: Kurt Brümann (Violin) and Karl Elbe (Piccolo): Waltz, Fantasiebilder (Jos. Strauss); Matrosen-Polka (Ziehrer); Hungarian Czardas, Zika (Michiels); Waltz, Manolo (Waldteufel); Polka (Waldteufel); Violin Solo: Czardas (Monti); Pestther-Walzer (Lanner); Piccolo Solo: Erinnerung an Amerika (Bürose). **8.0,** News. **8.10,** Act Two of Samson—Oratorio (Handel), relayed from Oldesloe. **9.0,** Time and News. **9.15,** See **Berlin (Deutschlandsender). 9.45,** Concert by the Hamburg Philharmonic Orchestra and the Station Male Voice Choir, conducted by Adolf Secker. Soloist: Otto Stadelmaier (Songs): Three Ballet Pieces (Rameau-Mottl). Choir: Gondellied (Schubert), Symphonic Poem, Mazeppa (Liszt). Solo Songs: (a) O komm im Traum (Liszt), (b) Drei Zigeuner (Liszt); Italian Serenade (Wolf). Choir: Der Feuerreiter (Wolf); Descriptive Piece, Der geheimnisvolle See (Schroeder); Musik am Abend (Graener); Waltz from Der Rosenkavalier (R. Strauss).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**12.5 p.m.,** Gramophone Concert. In the intervals at **12.20** and **1.0,** News. **1.30,** Programme arranged by the Post Office with Gramophone Records. **2.0** Agricultural Prices and Exchange. **2.15,** Programme for Children. **2.40,** Talk for the Housewife. **3.0** (from **Danzig**), Police Band Concert: March, Unterm Freiheitsstern (Blankenburg); Overture, Der Waldmeister (Joh. Strauss); Waltz, Alt-Wien (Kremser); Three Short Pieces (Jensen); Die Wacht an der Weichsel (Stieberitz); Reiterquadrille (Stieberitz); Two Norwegian Dances (Rebel); Overture, Il Guarany (Gomez); Waltz from The Gipsy Princess (Kálmán); Potpourri, Strauss, Millöcker and Suppé (Zeihrer); Grüss mir das blonde Kind am Rhein (Blon); Potpourri (Schreiner); Two Marches (Stephanie); (a) Wiener Jungarbeiter, (b) Als die gold'ne Abendsonne. In the interval at **3.50,** Book Review. **4.45** (from **Danzig**), Talk on Forestry. **5.15,** Agricultural Prices. **5.25,** The Song of the Canary—Bird Songs with Introductory Talk. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** News. **7.10,** Reading from Plautus im Nonnenkloster (Meyer). **7.45,** Concert by the Königsberg Opera House Orchestra, conducted by Erich Seidler. Soloists: Henny Wolff (Soprano) and Erich Börschel (Pianoforte). Sinfonietta giocosa (Ebel); Five Songs (Donisch); Music for Pianoforte and Orchestra (Pillney). **9.0,** News. **9.15,** See **Berlin (Deutschlandsender).** After the Programme, Sports Report, and Review.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.—11.40 a.m. to 3.40 p.m.**—Programme of the General Broadcasting Society (A.V.R.O.). **11.40,** Time Signal. **11.41,** Gramophone Music. **12.10 p.m.,** Concert of Light Music by Kovacs Lajos and his Orchestra. In the interval, Gramophone Music. **2.10,** Reading. **2.40,** Gramophone Music. **3.40 to 7.40,** Programme of the Workers' Radio Society (V.A.R.A.). **3.40,** Concert by the Small V.A.R.A. Orchestra, conducted by H. de Groot. **4.20,** Programme for Children. **5.10,** Orchestral Concert, conducted by Wins: The Scorcher (Rosey); Pluie d'or (Waldteufel); An Old Violin (Fischer); Rokoko Liebeslied (Meyer-Helmund); The Gondolier (Powell); Selection from Countess Maritza (Kálmán); Glockenserenade (Kockert); Heidenachtserenade (Kockert); La toupie (Gillet); Sonia (Partos); V.A.R.A. Medley (de Groot). **6.0,** Gramophone Music. **6.10,** Concert by the V.A.R.A. Orchestra, conducted by H. de Groot: Overture, Orpheus in the Underworld (Offenbach); Lotosblumen (Ohlsen); Dancing Dolls (Rust); Mandoline Serenade (Désormes); Potpourri of Ballet Music (Barrière). **6.50,** Talk. **7.10,** Concert (contd.): Bolek (Leopold); Waltz Potpourri (Robrecht); In the Teahouse of the Hundred Steps (Yoshitomo); Selection from A Kiss in Spring (Kálmán). **7.40 to 10.40,** Programme of the Liberal Protestant Radio Society (V.P.R.O.). **7.40,** Talk. **8.10,** Pianoforte Recital by Mlle. Roosje Mossel: Sonatina (Scarletti); Soeur Monique (Couperin); Piece (Couperin); Variations (Mozart); Sonatina in A (Mozart); Etude in F minor, Op. 25, No. 2 (Chopin); Etude in C minor, Op. 10, No. 12 (Chopin); Nocturne in F minor, Op. 15 (Chopin); Three Ecossaises (Chopin); Selection from Ba Ever (Vredenburg); Capricietto, Op. 36 (Toch); Extracts from the Suite, Op. 14 (Bela Bartok): La fille aux cheveux de lin (Debussy); Golliwog's Cakewalk (Debussy); Negro Dance (Scott); Andalusa (Falla). In the interval at **8.40,** Talk. **9.40,** Religious Notes and News. **9.55,** Talk. **10.25,** Gramophone Music. **10.40** till Close Down, V.A.R.A. Programme. **10.40,** Organ Solos by Jong, followed by Gramophone Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk,** on 50 kW., from **3.40 p.m.** Programme of the Christian Radio Society (N.C.R.V.).—**11.55 a.m.,** Gramophone Records. **12.10 p.m.,** Concert by the Van der Horst Ensemble: Heil Europa (von Blon); Overture, Berlin wie es weint und lacht (Conradi); Neu Wien (Jos. Strauss); Selection from Young Heidelberg (Millöcker); Selection from The Mastersingers (Wagner); Gramophone Records; Overture, Das Nachtlager von Granada (Kreutzer); Selection from The Barber of Seville (Rossini); Neapolitan Song (Calpolmi); Tout Paris (Waldteufel); March, Groot Rotterdam (Schootemeyer). **1.40,** Gramophone Records. **2.10,** Bible Reading. **2.40,** Gramophone Records. **3.25,** Interval. **3.40,** Organ Recital by Blaauw: Les Ferains (Berger); Selection from Mignon (Thomas); Melody (Fucik); Salut d'amour (Elgar); Serenade (Gounod); Suite (Blaauw). **4.40,** Violin, 'Cello, and Pianoforte Recital by Bähler, Janszen, and Mme. Bähler-Riewerts: Sonata in D (Leclair); Toccata (FrescobaldiCaccini); Sonata in C (Mozart); Violin and 'Cello Duet (Beethoven); Gramophone Records; Trio (Mendelssohn). **6.10,** Talk on Horticulture. **6.40,** Police Announcements. **6.55,** Religious Information. **7.10,** Literary Talk. **7.40,** Concert by the Arnhem Orchestra, conducted by Spaanderman; Soloist, Mme. Both-Haas (Soprano): Overture, Oberon (Weber); Air from Der Freischütz (Weber); Romance (Sibelius); Ballet Music from Sylvia (Delibes); Symphony No. 4 for Soprano and Orchestra (Mahler). In the interval at **8.40,** Recitation. **9.55,** News. **10.10,** Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by **Helsinki, 815 kc/s, 368.1 metres.**—**4.0 p.m.** (from **Helsinki**): Concert by a Mandoline Orchestra: Der musizierende Zigeuner (Eilenberg); Waltz, Etincelles (Waldteufel); Serenade (Heusser); Czardas No. 1 (Michiels). **4.25,** Talk. **4.50,** News in Finnish. **4.59,** Time and Weather. **5.10,** News in Swedish. **5.15** (from **Helsinki**): 'Cello Solos by Erkki Kihl: Sicilienne (Fauré); Rondo (Boccherini); Die Sehnsucht (Beethoven); O cara memoria (Servais). **5.40,** Programme relayed from the Academy at **Turku, 1,220 kc/s, 245.9 metres. 7.45,** News in Finnish. **8.0,** News in Swedish.

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.,** News and Weather. **12.35,** See **Frankfurt. 1.30,** Cookery Notes. **1.45,** Pianoforte Recital by Egbert Grape: Gavotte (Rameau); Variations on Unser dummer Pöbel meint (Mozart); Sonata in F (Beethoven); Rhapsody No. 12 (Liszt). **2.10,** Talk: Excursions in the Rhineland and Westphalia. **2.30,** Market Prices. **2.50,** Political Announcements. **3.0,** See **Frankfurt. 5.0,** English Conversation. **5.20,** Talk on Genealogy. **5.35,** Five Songs for Contralto, Pianoforte, Violin and 'Cello (Weismann). **5.50,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Stuttgart. 9.30,** See **Frankfurt. 9.45,** News and Sports Report. **10.0,** Music by the Station Dance Band, conducted by Külin. **11.15,** See **Frankfurt. 11.45** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**12.30 p.m.,** Concert Relay. **1.15,** News. **1.50,** Talk for Women. **2.35,** Market Prices. **3.0,** Orchestral Concert, conducted by Ernst Plietzsch, relayed from the Radio Exhibition. **4.30,** Book Review. **4.50,** Programme for Young People. **5.15,** Talk: The Ostrogoths. **5.40,** Market Prices and Review of the Day's News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** Concert of Operetta Music by the Station Orchestra, conducted by Hilmar Weber: Overture, Poet and Peasant (Suppé); Selection from Prince Methuselah (Joh. Strauss); Viennese Waltz (Ziehrer); Overture, Der Opernball (Heuberger); Selection from The Merry Widow (Lehár); Waltz from Die Tanzgräfin (Stolz); Selection from Wenn Liebe erwacht (Künneke). **8.0,** A Radio Sequence (Rudolf Mirbt). **9.0,** News and Sports Notes. **9.15 to 9.30,** See **Berlin (Deutschlandsender). 10.0,** Concert of Contemporary Music by the Leipzig Symphony Orchestra, conducted by Willy Steffen: Concertino for Two Flutes and String Orchestra (Hoyer); Chamber Symphony (Kirchner). **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW.—Dutch Evening.—**7.0 p.m.,** Gramophone Concert: Symphony No. 5 (Tchaikovsky); Overture, Tannhäuser (Wagner). **8.10,** Gramophone Concert: Overture, A Night in May (Rimsky-Korsakov); Overture, The Flying Dutchman (Wagner); Selection from L'Africaine (Meyerbeer); Selection from Manon (Massenet-Tavan). **8.50,** News in French. **9.0,** Song Recital with Gramophone Interludes. **9.45,** News in German. **9.55,** Gramophone Music: Ballet Music from Prince Igor (Borodin); Ballet Music from Faust (Gounod). **10.20,** Dance Music on Gramophone Records.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Concert relayed from the Théâtre des Champs Elysées, Paris: Overture, Phèdre (Massenet); Concert Version of La Pie Borgue—One-Act Opéra-Comique (Büsser); A Ballet in One Act (Strauss); Finale of the Orchestral Suite from Sylvia (Delibes); Concert Version of Act IV of Othello (Verdi); Melody (Chopin). After the Concert, News.

MADRID

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Light Music. **10.45,** Radio Chronicle. **11.0,** Concert. **11.45,** Light Music. **12 Midnight to 12.30 a.m. (Saturday),** I.B.C. Concert: Beautiful Spring (Lincke); Bananas (Whitcup); Selection from Yes, Mr. Brown; All through the Night; Sweet Hawaiian Dreams; Soft Lights and Sweet Music; Hot Feet; Star Song. **12.30,** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Announcements, Programme for Women and Dance Music.

NOV. 24th FRIDAY *continued*

8.15, Radio Journal. **8.30 to 9.30,** Interval. **9.30,** Chimes, Time and Radio Journal. **9.45** (approx.), Concert by the Madrid Symphony Orchestra, conducted by Enrique Fernández Arbós. **11.45,** Radio Journal and Programme Announcements for Listeners Abroad. **12 Midnight,** Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Plichta: Overture, The Thieving Magpie (Rossini); Symphony in B minor—The Unfinished (Schubert); Legend, Op. 54, No. 10 (Dvorak); Piece (Sebestik); Intermezzo (Kocian). **3.55,** History Talk. **4.5,** See **Prague. 5.5,** Tourist Report. **5.15 till Close Down,** See **Prague. 9.40** (approx.), Close Down.

MOSCOW

KOMINTERN, RW1, 202.5 kc/s, 1,481 metres; 500 kW.—**3.30 p.m.,** Agricultural Programme. **4.30,** Red Army Programme. **5.30,** Collective Farms' Programme. **6.30,** Medical Talk. **7.0,** Popular Concert. **8.0,** Talk in German: Moscow. **8.55,** Chimes from the Red Square. **9.5,** Discussion in English: Review of the Week, followed by News Bulletin. **10.5,** Talk in Czech: Soviet Law.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**3.30 p.m.,** Orchestral Concert, conducted by Erich Kloss. Prelude to Schirin und Gertraude (Graener); Romanian Folk Dances (Bela Bartok); Variations on a Silesian Christmas Carol (Kusche); Extract from the Nutcracker Ballet (Tchaikovsky); Oriental Suite, Das Minarett (Leopold); French Serenade (Grieg); A Peasant Song (Grieg); Waltz, Intermezzo, The First Letter (Rekov); March, Deutsche Hoffnung (Meindl). **4.45,** Reading for Young People: A German Catechism (Kleist). **5.5,** Symphonic Poem, Mazeppa (Liszt), on Gramophone Records. **5.25,** Reading: The Biography of the Sculptor, Ignatius Taschner (Ludwig Thoma). **5.45,** Time, Weather and Agricultural Report. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** Concert by the Station Orchestra, conducted by Hans Winter. Soloist—Annemarie Heyne (Pianoforte); Symphony—the Schoolmaster (Haydn); Pianoforte Concerto in D Minor (Mozart); Five Songs (Donisch); Orchestral Suite (Walter-Müller). **8.15,** Political Address. **8.35,** Violin and Pianoforte Recital by Willy Stuhlfauth and Richard Staab (Pianoforte); Hungarian Dance (Brahms); Moonlight on the Bosphorous (Vecsey); The Flight of the Bumble Bee (Rimsky-Korsakov); Waltz from Der Rosenkavalier (R. Strauss); The Zephyr (Hubay); Scherzo and Tarantella (Wieniawsky). **9.0,** Time and News. **9.15,** See **Berlin (Deutschlandsender).**

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres** and **Jeløy, LCL, 6,990 kc/s, 42.82 metres.**—**4.0 p.m.** Concert, relayed from **Bergen, 824 kc/s, 364 metres. 5.0,** Talk: Infection. **5.30,** Popular Concert by the Jacobsen Ensemble. **6.0,** Weather and News. **6.30,** Programme in English. **7.0,** Time. **7.1,** Concert by the Philharmonic Orchestra, conducted by Olav Kielland, relayed from the Logen Hall. Soloists: Elisabeth Unarhein-Ringdal (Pianoforte) and Rolf Schüttauf (Flute); Symphonic Dances (Grieg); Flute Concerto in D (Mozart); Symphonic Variations for Pianoforte and Orchestra (Franck); Les Preludes (Liszt). **8.40,** Weather and News. **9.0,** Topical Talk. **9.15** Literary Review. **9.45** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Report, Agricultural Notes, Report of the Royal Geographical Society and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Concert of Opera Music, conducted by Fortunato Russo. After the Concert, Talk and Announcements. **10.0,** Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.15,** Weather. **7.25,** News. **7.30,** Musical Programme by Rosemonde Gérard and Tiarko Richepin. **8.0,**

Political Review. **8.15,** Orchestral Concert, conducted by Flament: March Past of the Lead Soldiers (Turina); Polonaise (Scharwenka); Danse grecque (Ganne); Violin Solo, Melody (Koechlin); 'Cello Solo. Intermezzo, Le nozze di Magùula (Pedrollo); La berceuse (Waldteufel). **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music. **7.5,** Sponsored Talk. **7.15,** Le Journal Parlé. **7.55,** Review of the Week. **8.0,** Talk on Music. **8.30,** Enlevez-moi—Operetta in Three Acts (Praxy and Hallais). **10.30,** News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** Press Review and Weather. **12 Noon,** Jewish Talk. **12.30 p.m.,** French Music from 1870 to 1900. Gramophone Concert: Overture, Le Carnaval romain (Berlioz); Extracts from The Damnation of Faust (Berlioz); Prelude to Lohengrin (Wagner); The Death of Isolda from Tristan and Isolda (Wagner); Introduction to Act 1 of Fervaal (d'Indy); Overture, Gwendoline (Chabrier); Danse macabre (Saint-Saëns); Mater Dolorosa from Les Béatitudes (César Franck); Extracts from Gretna Green (Guiraud); Songs: Les berceaux (Fauré); Le Manoir de Rosamonde (Duparc); Overture, Le Roi d'Ys (Lalo). In the intervals at **1.0,** Exchange, News and Weather, and at **1.30,** Exchange. **2.0,** Addresses, relayed from the Académie des Inscriptions et Belles Lettres. **3.45,** Exchange and Market Prices. **4.30,** Elementary English Lesson. **6.20,** Agricultural Report, Weather and Market Prices. **6.45,** Social Assurance Societies' Reports. **7.0,** Literary Talk: André Cide. **7.20,** Gramophone Music: Melody (Kern); La ronde des heures (Sylviano); Badner Madla (Komzak); Fleche d'or (Vacher): Quand l'amour meurt (Cremieux); Les enfants terribles (Corbin); Il suffit d'un sourire (Borel-Clerc); Nogent-sur-Marne (Paradis). **7.45,** Commercial Notes and News. **8.0,** Readings (André Gide). **8.30,** News and Weather. **8.40,** Talk on Gastronomy. **8.45,** Symphony Concert, conducted by Eugène Bigot. Soloists: Léon Kartun (Pianoforte), Charles Panzera (Songs) and Mme. Lucienne Radisse ('Cello). Overture, Hansel and Gretel (Humperdinck); Pianoforte Concerto No. 4 (Saint-Saëns); Le Poème de l'amour et de la mer (Chausson); 'Cello and Orchestra: Georgian Rhapsody (Tcherepnin); Reflets d'Allemagne (Florent Schmitt). In the interval at **9.15,** Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.,** Musical Originalities, from **New York. 7.30,** KDKA Home Forum. **8.0** to **9.30, New York** Relay. **8.0,** U.S. Marine Band. **9.0,** Betty and Bob. **9.15,** Gene Quaw's Orchestra. **9.30,** News and Market Reports. **9.45,** Firenze Restaurant Orchestra, from **New York. 10.0,** Uncle Tom and Betty. **10.15,** KDKA Kiddies' Klub. **10.20,** The Singing Lady, from **New York. 10.45,** Orphan Annie, from **New York. 11.0,** News Reeler, by Pat Haley. **11.15,** Sports Notes and Programme Preview. **11.30,** Evensong. **11.45,** Lowell Thomas, from **New York. 12 (Midnight),** Amos 'n' Andy, from **New York. 12.15 a.m. (Saturday),** The Silver Toppers. **12.30 to 3.30, New York** Relay. **12.30,** Potash and Perlmutter. **12.45,** Irene Rich for Welch. **1.0,** Popular Programme. **1.30,** Dangerous Paradise. **1.45,** Red Davis. **2.0,** Let's Listen to Harris. **2.30,** Variety Programme. **3.0,** The Iron Master.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See **Moravská-Ostrava. 3.55,** Talk. **4.5,** Concert by the Ondricek Striug Quartet with Stepanova-Kursova (Pianoforte); Quartet in E flat, Op. 12 (Karel); Pianoforte Qnartet in G minor, Op. 25 (Brahms). **5.5,** Agricultural Programme. **5.15,** Talk for Workers. **5.25,** News in German. **5.30,** German Transmission: Talk on Hygiene. **6.0,** Time, News and Weather. **6.10,** English Conversation Lesson. **6.25,** Introductory Talk to the following Transmission. **6.30,** The Bride of Messina—Opera (Fibich) relayed from the State Opera House. In the interval, Reading. **9.10,** News, Review of the Day and Sports Notes. **9.25,** News in Russian. **9.40** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather.. **11.40** (from **Lausanne**), Concert by the Small Radio-Lausanne Orchestra, conducted by Moser. **12 Noon** (from **Lausanne**), Financial Notes. **12.10 p.m.** (from **Lausanne**), Concert (contd.). **1.0,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0,** See **Schweizerischer Landessender. 5.0,** (from **Geneva**), Programme for Women. **5.30** (from **Geneva**), Esperanto Lesson. **5.40** (from **Geneva**), English Lesson. **6.5** (from **Geneva**), Talk on Bridge. **6.20** (from **Geneva**), Talk for Chess-Players. **6.35** (from **Geneva**), Illustrated Talk: Newly-released Gramophone Records. **6.59** (from **Geneva**), Weather Report. **7.0** (from **Geneva**), Concert of Sacred Music by the Mixed Choir and William Montillet (Organ), relayed from St. Joseph's Church. **8.0** (from **Geneva**), Humorous Programme. **8.20** (from **Geneva**), Recital of Old Songs by Willy Aeschlimann. **8.50** News and Weather. **9.0** (from **Geneva**), Report from the Automobile Club. **9.5** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.;** and **2RO, 11,810 kc/s, 25.4 metres.**—**12 Noon to 1.15 p.m.,** Orchestral Concert: Oh, Mona (Weins); Perchè? (Leon-Chiappo); L'ultimo amore (Culotta); Waltz, Lontano (Malatesta); Selection from Rose Marie (Friml); My Golden Bay, from The Flower of Hawaii (Abraham); Toreador et Andalouse (Rubinstein); Cecco Cieco (Restelli). In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.0,** Choral Concert, conducted by Bonaventura Somma, relayed from the Academy of St. Cecilia. **5.0 to 5.5,** Weather. **5.40 (Naples),** Shipping and Sports Notes. **5.57,** Report of the International Institute of Agriculture (in Spanish, German and French). **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time, Announcements and Sports Notes. **7.15,** Concert. **7.45,** Military Band Concert, conducted by d'Elia. In the interval: Gli Orazi ed i Pancrazi—Play in One Act (Giuseppe Adami). **10.0,** Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.**—**7.30 p.m.,** Friday Steeplechase, from **New York. 12.45 a.m. (Saturday),** Stock Reports. **1.0 to 4.0, New York** Relay. **1.0,** Concert. **2.0,** Fred Allen; Feide Grofe's Orchestra. **2.30,** Variety Programme; Victor Young's Orchestra. **3.0,** First Nighter, Sketch. **3.30,** Lum and Abner's Old Time Friday Night Sociable. **4.0,** Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.,** Gymnastics. **11.0** (from **Basle**), Instrumental Solos on Gramophone Records. **11.29,** Time from Neuchâtel Observatory, Weather and News. **11.40** (from **Basle**), Orchestral Music and Songs on Gramophone Records. **12.25 p.m.** (from **Basle**), Time, Weather and Exchange. **12.30** (approx.), Interval. **2.30** (from **Zürich**), Descriptive Music and Marches on Gramophone Records. **2.59,** Time from Neuchâtel Observatory. **3.0** (from **Zürich**), Concert by the Radio Orchestra. **4.0,** Gramophone Music. **4.10,** Concert by the Small Radio Orchestra, conducted by Max Scherbaum. **5.0** (from **Zürich**), Programme for Children. **5.30,** Sports Talk: The Swiss Ski-ing School. **6.0** (from **Berne**), Time, Weather, Market Prices, Tourist Report and Sports Notes. **6.25,** Concert by the Radio Orchestra. **6.40** (from **Berne**), Song Cycle—Frauenliebe und-leben (Schumann) by Lore Fischer (Contralto). **7.5** Concert by the Radio Orchestra. **7.15** (from **Berne**), A Visit with the Microphone. **7.30** (from **Berne**), Lecture Recital: Fairy Tales from Five Continents. **8.0,** Weather and News. **8.10,** Concert by the Radio Orchestra. **8.25** (from **Berne**), Mozart in Mannheim. **9.15** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**12 Noon to 12.30 p.m.,** Broadcast for Schools. **4.5,** Programme of Country Music relayed from **Malmö, 1,301 kc/s, 230.6 metres. 4.20,** Reading. **4.45** Gramophone Music. **5.45,** Legal Talk. **6.15,** Weather and News. **6.30,** Religious Talk: The Ecclesiastical Year from All Saints' to Midsummer, relayed from **Uppsala, 662 kc/s, 453.1 metres. 7.0,** Relay from the Opera House. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Light Music on Gramophone Records. **12.45 p.m.,** News. **1.0,** Time and Exchange. **1.5,** Dance Music on Gramophone Records. **2.0,** Interval. **4.45,** Literary Talk. **5.0,** Orchestral Concert, conducted by Roskam. March, Hollywood (Léopold); Valse de Claudine (Berger); Overture, The Golden Cross (Brüll); 'Cello and Orchestra: Abendlied (Schumann); Selection from Mignon (Thomas); Melody, Des fleurs sous vos pas (Letelier); Slav Rhapsody (Friedemann); Marche parisienne (Ganne). **6.0,** Trio Concert, relayed from **Lille, 1,128.5 kc/s, 265.8 metres. 7.0,** Topical Talk in German on the Skilled Trades. **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German, Lottery Results and Announcements. **8.30,** Concert by the Station Orchestra, conducted by Maurice de Villers. Soloists: Jeanne Wolferstaedter (Pianoforte) and Gertrude Schmidt-Derckum (Contralto). Part I: Symphony No. 7 (Beethoven); Pianoforte and Orchestra: Fantasia (Dumas). Part II: Philippe Gaubert Music. Selection from Fresques; Song, with Orchestral Accompaniment, Soir païen; Violin Solo: Berceuse; Four Ballads; Two Flutes and Harp: Divertissement gree; Two Songs: (a) Mon petit âne, (b) Automne; Ballet Music from Naïla. In an interval at **9.15** (approx.), Press Review in French. **10.30** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**11.0 a.m.,** Concert by the Station Orchestra, conducted by Gustav Görlich; Soloist, Otto Sonnen (Pianoforte): Overture, Alphonso und Estrella (Schubert); Pianoforte Solo, Kinderszenen, Op. 15 (Schumann); Suite, Mozartiana (Tchaikovsky); Pianoforte Solos, Three Romances, Op. 28 (Schumann); Romantic Suite (Lautenschläger). **12.15 p.m.,** See **Frankfurt. 12.25,** Local News and Weather. **12.35,** See **Frankfurt. 3.0,** See **Frankfurt. 5.0,** See **Langenberg. 5.35,** Medical Talk. **5.50,** Time, Agricultural Report, and Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** Demonstration of Welcome for Eugen Hadamovsky, Head of the German Broadcasting System, relayed from the Würtemburg Staatstheater. **9.30,** See **Frankfurt. 9.45,** Local News, Weather and Sports Report. **10.0,** See **Langenberg. 11.15,** See **Frankfurt. 11.45** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Music by an Argentine Band. **6.30,** Songs. **6.45,** Opera Music: Overture, Banditenstreiche (Suppé); Selection from Romeo and Juliet (Gounod); Passepied from La basoche (Messager). **7.0,** Accordion Solos. **7.15,** News. **7.30,** Overture, Tannhäuser (Wagner) by the Station Orchestra. **7.45,** Opera Music: Aria from Hérodiade (Masscnet); Cavatina from Norma (Bellini); Arias from: (a) Così fan tutte (Mozart). and (b) Il Trovatore (Verdi). **8.0,** Concert of Military Music and Chansonettes. **8.30,** Light Orchestral Music. **9.0,** At the Music-Hall—a Radio Play. **9.30,** Music by a Viennese Orchestra. **10.0,** Extracts from Sound Films. **10.15,** News. **10.30,** Concert for Listeners in Morocco. Part I: Orchestral Music: Invitation to the Waltz (Weber); Overture, The Caliph of Bagdad (Boeildieu). Part II: Opera Music: Aria from Manon Lescaut (Auber); Duet from Carmen (Bizet); Aria from Mignon (Thomas). **11.0,** Music by an Argentine Band. **11.15,** Dance Music. **12 Midnight,** News. **12.5 a.m. (Saturday),** Songs. **12.15,** Hawaiian Guitar Music. **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.,** Concert of Chamber Music: Nives Buzzai (Pianoforte) and Dalia Fortuni (Mezzo-Soprano). Pianoforte Solos: (a) Berceuse (Cimadori), (b) Arabesque (Linden), (c) Scherzo, Op. 23 (Martucci); Mezzo-Soprano Solos: (a) Ave Maria (Schubert). (b) Come raggio di sol (Caldara), (c) Ich grolle nicht (Schubert); Pianoforte Solos: (a) Ecossaises (Beethoven), (b) The Fountain (Niemann), (c) Risveglio delle fate (Prudent-Sgambati); Mezzo-Soprano Solos: (a) Aria from Mignon (Thomas), (b) Serenata (Tosti). **5.0** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.,** Concert of Italian Music. Soloist: Rita de Vieenzi (Soprano). Songs: (a) Mai più, mai più (Gaetano Greco), (b) Dio (Nando Bennati), (c) Il bacio della luna (Rocchi); Quartet in D for Two Violins, Viola and 'Cello (Guidi). **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Dopolavoro Report and Gramophone Music. **6.0,** Time, Report of the Royal Geographical Society and Gramophone Music. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** News and Weather. **7.15,** Gramophone Music. **7.30,** Symphony Concert, conducted by Adriano Lualdi. Talk in the interval. **9.0,** Orchestral Concert. **10.0,** Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15, a.m.,** Religious Information in German. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: Celtic Overture (Foulds); Ballet Suite, Esmeralda (Drigo); Zigeunerweisen (Sarasate); Madrigale (Ganne); Waltz, A l'appel de plaisir (Gabriel Marie); Entr'acte from The Snow-Man (Korngold); Grieg Fantasia (Urbach); Ballet Overture (Ganglberger); Polka-Mazurka, Brennende Liebe (Jos. Strauss); Masquerade from The Merchant of Venice (Sullivan); Odalisken-Walzer (Reiterer); Wien, sterbende Märchenstadt (Leopoldi); Selection from Gipsy Love (Lehár); Gallop, Vienna (Ziehrer). In the interval at **12 Noon,** Time and News. **1.0,** Interval. **2.0,** Time, Weather and Exchange. **2.20,** Talk: Youth and Games. **2.30,** Talk for Young People: Schubert. **2.45,** Gramophone Concert. **3.35,** Talk for Women: Joe Lederer, Anna Lorenz and Rosa Lehmann. **4.0,** Talk. **4.20,** Pianoforte Recital by Hilde Adler: Albumblatt (Marx); Arabesque and Toccata (Debussy); Pastorale (Poulenc); Jeux d'eau (Ravel); Alborada del gracioso (Ravel); Bohemian Song (Moszkowsky). **4.55,** Traffic Report. **5.10,** Talk on Ski-ing. **5.25,** Sports Report. **5.35,** Talk: Heroism and Holiness. **6.0,** Children's Concert by the Wiener Symphoniker, conducted by Josef Holzer; Soloists, Lizzi Holzschuh (Soprano), Heinrich Friedl (Tenor), and Anton Grabner (Soprano): Children's Patrol (Gillet); The Toy Symphony (Haydn); Soprano and Tenor Duet from Der lustige Krieg (Joh. Strauss); Polka, Rutscherpeter (Ziehrer); Soprano Duet from The Merry Peasant (Fall); Selection from Hansel and Gretel (Humperlinck); Soprano and Tenor Duet from The Dollar Princess (Fall); Soprano and Tenor Duet from Ihr Adjutant (Winterberg); Polka, Ringelreia (Suppé); Soprano and Tenor Duet from The Rose of Stamboul (Fall); Kinderliedermarsch (Ziehrer). **7.0,** Time, Weather and Programme Announcements. **7.10,** Weekly Feuilleton. **7.40,** Topical Programme. **7.55,** Concert by the Wiener Symphoniker, conducted by Oswald Kabasta. Soloist: Juan Manén (Violin). **8.55,** Talk. **9.5,** News. **9.20,** Variety Concert, relayed from the Oase. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5,** Concert of Chamber Music, relayed from **Lwów, 788 kc/s, 381 metres.** In the interval at **11.30,** Radio Journal and Weather Report. **12 Noon,** Interval. **2.30 p.m.,** Economic Notes. **2.40,** News. **2.45,** Boy Scouts' Report. **2.50,** Maritime and Colonial Notes. **2.55,** Soprano Solos by Perkowska: Elsa's Dream from Lohengrin (Wagner); Ne fais pas de couronnes de fleurs (Glière); Si je changeais (Niewiadomski); Black Butterflies (Wertheim); Soldiers' Song (Moniuszko). **3.10,** Quartet, Op. 135 (Beethoven) on Gramophone Records, with Introductory Talk. **3.40,** Talk. **3.55,** Pianoforte Recital of Viennese Music by Oscar Kosches: Soirées de Vienne (Schubert-Liszt); Ballet Music from Rosamunde (Schubert-Fischhof); Viennese Dance No. 31 (Friedman-Gärtner); Old Vienna (Godowski); Gavotte (Helmesberger); Melody (Sauer); Viennese Waltz Potpourri (Schlösinger); Viennese Silhouettes (Kosches); Melody (Joh. Strauss-Grünfeld). **4.40,** Baritone Solos by Carlo Galeffi, on Gramophone Records. **4.50,** Agricultural Report. **5.0,** Talk. **5.20,** Light Music by the Landowski and Pewzner Orchestra, relayed from the Adria Café. **6.0,** Programme Announcements. **6.5,** Miscellaneous Items. **6.20,** Talk: What to do on Holidays. **6.25,** Reading. **6.40,** Sports Notes. **7.0,** Talk on Music. **7.15,** Symphony Concert by the Philharmonie Orchestra, conducted by Horenstein. Soloist: Simon Goldberg (Violin). The Brandenburg Concerto (Bach); Violin Concerto in D, Op. 61 (Beethoven); The Fifth Symphony in C minor (Beethoven); Bolero (Ravel); Violin Solos. In the interval at **8.0,** Reading. **9.40,** Cigány Music from the Maison Foukier. **10.0,** Aviation Weather Report and Police Notes. **10.5,** Cigány Music (contd.).

ZURICH.—See **Schweizerischer Landessender.**

SATURDAY

NOVEMBER THE TWENTY-FIFTH

ALGIERS

825 kc/s, 363.3 metres; 13 kW.—**7.15 p.m.,** Agricultural Report and Weather Forecast. **7.20,** Request Gramophone Records. **7.55,** News. **8.0,** Time. **8.2,** Concert by the Station Orchestra. **8.30,** News. **8.35,** Popular Melodies. **8.45,** Concert (contd.). **9.30,** News. **9.35,** Recitations. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.**—**1.30 to 2.30 p.m.,** Time Signal. Weather Report, Stock Report and Gramophone Concert. **6.0,** Gramophone Concert. **6.45,** News. **7.0** The Poetry of J. Boyle O'Reilly, by Gabriel Fallon. **7.15,** Gaelic Talk. **7.30,** Time Signal. **7.31,** The Dream of Gerontius—Oratorio (Elgar), by the Dublin Philharmonic Society, relayed from the McEntire Hall, Dublin. Soloists: Steuart Wilson, Jean Nolan and Robert Irwin. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert of Dance Music: Home on the Range (Traditional); If I had somebody to love (Hill); Niagara Moon (Heymann); It's within your Power (Revel); In the Park in Paree (Rainger); Dixie Doorway (Parish); The Whisper Waltz (Burke); This time it's Love (Lewis). **10.0,** Concert of Light Music: Acclamations Waltz (Waldteufel); Ke-sa-ko (Chapuni); Song: A Banjo Song (Homer); Racing Commentary; Pierrette's Wedding (Jordon); Saxophone Solo: Valse Marguerite (Sannella); Song, Beauty's Eyes (Weatherley); Love in Cloverland (Peter). **10.30** I.B.C. Goodnight Melody, followed by Weather and News. **10.40,** Bass-Baritone Solos **10.50,** Pipe Solos (Eamonn Potts). **11.0** (approx.) Close Down.

BARCELONA

EAJ1 358 kc/s, 349.6 metres; 8 kW.—**5.30 p.m.,** Programme for Children. **7.0,** Request Gramophone Records. **7.30,** Exchange and Request Gramophone Records (contd.). **8.0,** Gramophone Music. **8.15,** Anti-War Talk, Gramophone Music and News. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5,** Educational Talk. **9.30** (approx.), Part Relay of an Opera from the Gran Teatro del Liceo. In the interval at **11.0,** News.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Children. **3.55** (approx.) **to 7.0,** See **Rome. 7.0,** News in Albanian. **7.30** (approx.) till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—**6.0 p.m.,** Gramophone Music. **6.20,** Talk. **7.0,** Choral Concert. **7.50,** Humorous Programme. **8.20,** Flute Concerto (Mozart), by Srejovic and the Station Orchestra. **8.50,** Time and News. **8.55** (approx.), Popular Songs by Ljubica Milivojevic and the Station Orchestra. **9.40,** Dance Music, relayed from the Auto Club.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**12.45 p.m.,** News. **1.0,** Gramophone Concert: Extract from Armide (Gluck); Ballet Music from Idomeneo (Mozart); Polonaise from Eugene Onegin (Tchaikovsky); Ballet Music from Aida (Verdi); Ballet Music from Faust (Gounod); Dance of the Apprentices from The Mastersingers (Wagner); Salomé's Dance from Salomé (Strauss); Ballet Music from Benvenuto Cellini (Berlioz); Selection from Carmen (Bizet); Dances Nos. 8 and 17 from Prince Igor (Borodin). **2.0,** Handwork for Children. **2.30,** Weather and Exchange. **2.45,** Reading. **3.0,** Concert from **Hamburg. 4.0,** Sports Review. **4.20,** Through Germany—Variety Programme. **5.0,** Poems. **5.5,** Talk: Women, Race and Nation. **5.30,** Programme for Young People. **5.45,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** To-day's Motto. **7.5,** Dance Music from **Munich. 8.0,** Gramophone Records. **8.30,** Viola d'amore Recital of Eighteenth Century Music, by Emil Seiler. **9.0,** News and Sports Notes. **9.25,** A Discussion on Winter Sports. **9.45,** Weather. **10.0,** Talk The Care of the War Graves.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed from **Zeesen, DJC, DJA, DJD, DJB** and **DJE.**—**3.0 p.m.,** Orchestral Concert of Unemployed Musicians; Conductor: Friedrich Jung: Ballet Music from Idomeneo (Mozart); Capriccio pastorale (Frescobaldi); Three Pieces, Op. 74 (Klugnardt); Bilder aus dem Süden, Op. 29 (Nicodé); Scherzo. Irrlichter und Kobolde from Op. 94 (Hoffmann); Pizzicato-Arabesque (Fanchetti); Sorgenbrecher-Walzer (Joh. Strauss). In an interval at **4.0,** Talk: The Merits of Table Tennis. **4.30,** Weekly Sound News. **5.0,** Pianoforte Recital of Scandinavian Music by Erwin Hansche: Praeludium, Op. 1 (Cleve); Five Norwegian Peasant Dances, Op. 72 (Grieg); Three Pieces (Palmgren): (a) Metamorphosis, Op. 71, (b) The Swan, Op. 28, (c) Dance Humoresque, Op. 35. **5.20,** Reading of Fairy Tales (Gert Hartenau-Thiel). **5.30,** The Funkstunde informs its Listeners. **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.5,** Our Heritage—Literary and Musical Programme, with Gramophone Interludes; The Berlin Station Choir, conducted by Heinzkarl Weigel and Soloists: Part I, The Dance of Death; Part II, A Play about the Mediæval Flemish Painters, Breughel, Till Eulenspiegel and Timmermann. In the interval at **9.0,** News. **10.50** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**7.0 p.m.,** Radio Journal. **7.55,** Sports Notes. **8.0,** News and Exchange. **8.5,** English Lesson. **8.20,** News. **8.30,** Gramophone Music. **9.0,** Musical and Literary Programme.

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—**6.0 p.m.,** See **Prague. 7.25,** Gala Concert by the Vocal Union of Slovak Teachers, relayed from **Turcansky-St. Martin. 9.0,** See **Prague. 9.15,** Concert of Light Music by the Station Orchestra. **10.30** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc,s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**10.50 a.m.,** Concert by the Station Orchestra, conducted by Gerhard Ewald Rischka: Overture, Nachklänge aus Ossian (Gade); Selection from Boris Godunov (Mussorgsky); Märchen (Aletter); Waltz (Dvorák); Dance; Kleine Suite No. 1 (Schumann-Rischka); Liebeswalzer (Ziehrer); Overture, Die Landstreicher (Ziehrer); See-Idyll (Dennison); Waltz, Blumen der Liebe (Rust); Selection from Three Old Maids (Kollo); Old Heidelberg (Klose). **12.45 p.m.,** Time and News. **1.10,** Gramophone Concert. **1.40,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices. **2.25,** Review of the Week's Films. **2.40,** Talk: The Importance of History for the Younger Generation. **3.0,** Orchestral Concert relayed from the Kaffee Vier Jahreszeiten. **4.30,** Talk: Programmes for the Coming Week. **4.40,** Programme to be announced. **5.0,** Sonata in F. Op. 6, for 'Cello and Pianoforte (R. Strauss) by Karl Greulich and Kurt Hattwig. **5.45,** Programme Announcements. **6.0,** Transmission for all German Stations relayed from **Leipzig. 7.0,** News. **7.10,** War Heroes and the National Revolution—Literary and Musical Programme. **9.0,** Time and News. **9.30,** Concert by the Station Orchestra, conducted by Gerhard Ewald Rischka: Overture, Light Cavalry (Suppé); Introduction and Chorus from Das Pensionat (Suppé); Suite from Coppélia (Delibes); Ein Fest in Aranjuez (Demersseman); Lehariana (Lehár); Waltz, Abschiedsrufe (Joh. Strauss); March, Vivat Silesia (Michalke). **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.0 p.m.,** Concert by an Unemployed Orchestra, conducted by Hanousek: Spanish March (Pelikan); Intermezzo (Leopold); The Emperor Waltz (Joh. Strauss); Serenade, Il bacio (de Micheli); Selection from The Gipsy Princess (Kálmán); Liberty March (Vackar). **3.50,** See **Prague. 4.15,** Talk in Esperanto, with Gramophone Illustrations: Suk as a Composer. **4.25,** See **Prague. 4.50,** Gramophone Music. **5.0,** Literary Talk. **5.15,** See **Prague. 5.25,** German Transmission: News, followed by Music from Operetta and Sound Films. **6.0,** See **Prague. 6.10,** Concert by the Station Orchestra, relayed from the Stadium; Conductor, Bakala; Soloist, Holub (Violin): Allegro vivace (Jirovec); Violin Concerto in D (paganini); The Nutcracker Suite (Tchaikovsky); Slav Dance No. 5 (Dvorak). **6.55,** Wireless Talk. **7.10,** You don't know Radio!—Sketch. **7.50,** Surprise Programme. **8.0,** Cabaret Programme, relayed from the Stadium; The Station Orchestra, conducted by Polasek, and Soloists. **9.0,** See **Prague. 9.15** till Close Down, See **Bratislava. 10.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by Mickey's Club Jazz Attraction. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: Comedy Overture (Kéler-Béla); Serenade (Saint-Saëns); Caucasian Suite (Ippolitov-Ivanov); Violin Solo: The Londonderry Air (arr. Kreisler); Selection from Les Georgiennes (Offenbach); Napoli-Serenade (d'Ambrosio); Selection from Pas sur la Bouche (Yvain). **4.45;** Talk: The League of Nations. **5.0,** Concert by the Radio Orchestra, conducted by Franz André: Le Cabriolet enchanté (Aekermans); Marionetten auf der Spieluhr (Armandola); The Railway (Brusselmans); Aubade (Caludi); Foxtrot, Twenty Million People (Johnstone); En badinant (d'Ambrosio); Napoli-Serenade (d'Ambrosio); Sonny Boy (de Sylva and Jolson); Two-Step (Grothe); Waltz (Sylvanio); Foxtrot (Wallace); Selection from The Nutcracker (Tchaikovsky). **6.0,** Talk on the Professions: The Orchestral Conductor. **6.15,** Gramophone Records: Etudes Nos. 1 and 12 (Chopin); Bal de Fleurs (Jongen); Sonata No. 10 (Handel); Prelude (Prokofiev). **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Der Schauspieldirektor (Mozart); Two Pieces (de Taeye): (a) Rêve crepusculaire à Sina, (b) Par un elair matin; Potpourri of Limousin Airs (Rouchard); 'Cello Solo: Neapolitan Serenade (Sgambati); Selection from Le Cœur et la Main (Lecocq); Old Song (Delisle); Serenatella timida (Tonelli); Suite, Nuorelse (Candiolo). **7.30,** Wireless Notes. **8.0,** Rabaud Concert by the Station Symphony Orchestra, conducted by the Composer: Divertissement on Russian Songs; English Suite; Ballet Music from Marouf; Symphony. In the interval at **8.45,** Un Mystère Sans importance—Sketch (Tristan Bernard). **9.45,** Dance Music on Gramophone Records. **10.0,** Le Journale Parlé. **10.10,** Music by the Chas Remue Orchestra and the Juan Thibo Tango Band, relayed from the Plaza Hotel.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Fra Diavolo (Auber); Waltz, Auf du grünen, schönen Narenta (Komzak); Marionetten auf der Spieluhr (Armandola); Selection from I Pagliacci (Leoncavello); Serenade for Violin (Drdla); Russian Dance (Luigini); Dolce melodia (Caludi); Selection from Aennchen von Tharau (Strecker). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by Mickey's Club Jazz Attraction, conducted by Ludo Langlois. **5.0,** Talk on Richard Strauss' Don Quixote. **6.10,** Reading. **6.30,** Gramophone Concert: Classical Fragments; Selection from Wild Violets (Stolz); Tauber; O flüsterndes Silber (Melchert); Selection from The Gondoliers (Sullivan); Sea Shanties; Waltzes (arr. Debroy Somers); Gershwin Potpourri, Ich wollt' meine Liebe ergösse sich (Mendelssohn); Selection from Love me to-night. **7.30,** Film Notes. **8.0,** Concert by the Station Orchestra, conducted by André; Soloist, Sterkens (Tenor): Flemish Folk Songs (Schoemaker); Russian Dance No. 6 (Bullerian); Ballet Music from William Tell (Rossini); Popular Flemish Songs; Finale from the Violin Concerto (Mendelssohn); Persian Suite (Tournier); La boutique fantasque (Rossini-Respighi); 'Cello Concerto (Saint-Saëns); Fantasia Suite (Foulds); Songs; Second Small Suite (de Micheli). In the interval, Humorous Monologues. **10.0,** Le Journal Parlé. **10.10,** See **Brussels (No. 1).**

BUCHAREST

760 kc/s, 394.7 metres; 12 kW.—**4.0 p.m.,** Dance Music by the Ghinda Jazz Band. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Harp Solos. **7.30,** Talk. **7.45,** Song Recital. **8.15,** Dance Music (on Gramophone Records). **8.45** Radio Journal. **9.0,** Romanian Music by the Station Orchestra, conducted by Dinico.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **7.15 p.m.** (approx.) till Close Down.—**4.0 p.m.,** Reading. **4.30,** Choral Concert. **5.10,** Answers to Correspondence. **5.30,** Concert by the Arpád Toll Cigány Band. **6.0,** Talk. **7.0,** News. **7.15,** A Comedy (Ludwig Zilahy). **9.15,** Weather. **9.20** (approx.), Jazz Music, relayed from the Ritz Hotel. **9.45,** Orchestral Concert, conducted by Polgar: Musical Comedy Overture (Lincke); Long live the Waltz (Garami); Potpourri of Folk Songs (Pazeller); Waltz Song (Milian); Johann Strauss Potpourri (H. Weber).

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek, OXY.**—**11.0 a.m.,** Time and Chimes from the Town Hall. **11.15,** Talk and Reading: Characteristics of Danish Authors: Alexander Kielland. **11.45,** String Ensemble Concert relayed from the Hotel Angleterre. **1.0 p.m.,** Interval. **1.30,** Gramophone Concert. **2.0,** Programme for Children. **2.30,** Concert by the Mogens Hansen's Instrumental Ensemble: March (Mottlau); Romantic Overture (Kéler Béla); Overture to Gianni Schicchi (Puccini); Waltz, Paysage d'automne (Waldteufel); Antique Minuet (Hermansen); Scandinavian Lullaby (Hermansen); Waltz from Eugene Onegin (Tchaikovsky); Overture, La mascotte (Audran); Overture, The Merry Widow (Lehár); Romance (Sibelius); Andante and Serenade for Two Violins and Pianoforte (Godard); Minuet (Riisager); Entry March of the Gladiators (Fucik). **4.30,** Exchange and Fish Market Prices. In an interval at **4.15** (approx.), Danish Songs by Marie Meier Hansen. **4.45,** Talk with Gramophone Illustrations: The Sistine Choir. **5.15,** French Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.16,** Talk: Polish Peasant Art. **6.30,** Talk: The Care of Children. **7.0,** Time and Chimes from the Town Hall. **7.1,** Talk: Danish Dramatic Poetry. **7.45,** Radio Ball for the Older Generation by the Station Orchestra, conducted by Launy Gróndahl: March (Czibulka); Waltz, Toujours ou jamais (Waldteufel); Polka (Lumbye); Sekstur (Lumbye); Tyrolese Waltz (Lumbye); Mazurka (Möller); Bellman Songs to the Lute by Alf Gildsig; March (Fucik); Waltz, Dreams on the Ocean (Gungl); Melody (Gungl); Polka (Stockmarr); Swedish Masquerade (Stockmarr); Quand l'amour meurt (Cremieux); Dance Suite, A Christmas Betrothal (Lumbye); Waltz (Lumbye); Polka (Métra); March (Reesep); Polka (Jensen); Mazurka (Klinhwort); Lancers (Mikel); Polka (Mikel); March (Fröhlich); Mazurka (Ganne); Waltz Amelia (Lumbye); London Polka (Métra); Pas de quatre (Métra); Can-Can (Erichsen); Gallop, Champagne (Lumbye). In the interval at **9.10,** News, and at **9.15,** Pianoforte Solos. **11.0,** Time and Chimes from the Town Hall.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. till 12 Noon,** Happy Hour: Part I—Concert of Gramophone Records: Signature Tune; She's Everybody's Sweetheart now (Hargreaves); Swanee Mammy (Moret); Who do you think you are? (Heymann); You did Everything for me (Conelly); How deep is the Ocean? (Berlin); Fairy Tale (Heykens); Pianoforte Solo: My Heart stood still (Rodgers); Cocktails (Cuvelier); Part II—Dance Music: My Lucky Day; Lay your Head on my Shoulder; Isn't it Heavenly?; Dawn in Montmartre; 'Twixt the Devil and the Deep Blue Sea; I bring a Song; I've found the Right Girl; About this Time next Week; Signature Tune. **12 Noon,** Programme in French. **3.30 to 6.0 p.m.,** Programme in English by the I.B.C. **3.30,** Mandoline Band: La Czarine (Ganne); Mandoline (Thomé); In Old Seville (Ege); Capriccio Mazurka (Arienzo); Napolitana (Hay); Mandolinata (de Pietro); Tesoro Mio (Becucci); Waltz, The Blue Danube (Joh. Strauss). **4.0,** Dance Music: Won't you stay to Tea; No more Love; Someone to care for; When my Little Pomeranian; I shall still keep smiling; Something came and got me in the Spring; The Song of the Rose; Pickaninnies' Heaven. **4.30,** The I.B.C. Nursery Corner, with Columbus and Belinda; Birthday Greetings; Trumpets. **4.40,** Tunbridge Wells and Isle of Thanet Orchestral Concert: Selection from The Merry Widow (Lehár); My Hero, from The Chocolate Soldier (O. Straus); Song, from Frederica (Lehár); Selection from The Quaker Girl (Monckton); Musical Comedy Switch (arr. Hall); Selection from Wild Violets (Stolz); Take a Pair of Sparkling Eyes (Sullivan); If I am dreaming (Mackaben); You are my Heart's Delight (Lehár); Selection from The Gipsy Princess (Kálmán). **5.30,** Dover and Folkestone Concert of Balalaika Music: Moment musical (Schubert); Russian Potpourri, Moonlight; Mazurka (Wieniawsky); Troika and a Lady (Andraiev); The Red Sarafan (Leontiev); Faun (Andraiev); Shining Moon (Traditional); Signature Tune. **5.45,** Concert: Morning, Noon and Night (Swanstrom); Mary Rose (Parr-Davies); Sentimental Gentleman from Georgia (Perkins); I've found the Right Girl (Lupino). **6.0,** Programme in French. **11.0** till Close Down, Programme in English by the I.B.C. **11.0,** Talkie Time; Tunes from the Talkies and Shows: Signature Tune; Sittin' in the Dark; Selection from Splinters; Falling in Love again (Hollander); Mrs. Bartholomew (Ellis); Cuban Love Song (Fields); Under the Roofs of Paris (Moretti); Dance Pretty Lady (Strauss); In the Park in Paree; A Glass of Golden Bubbles (Strauss); Signature Tune. **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Signature Tune, Come back to Erin; March, Light of Foot (Latann); Well done, Gordon (Gilbert); The Teddy Bears' Picnic (Bratton); Song, Innis Farrell (Aitken); The Hunt in the Black Forest (Voekler); Praeludium (Järnefeldt); Tipperary (Williams); Valse triste (Sibelius); Signature Tune, Come back to Erin. **12.5 a.m. (Sunday),** Late News Bulletin in English. **12.10** (approx.), Club Concert for Rugby Listeners: Signature Tune, Chum Song; Look what you've done (Kalmar); My Moonlight Madonna (Fibich); Oh, Johanna (Lawrence); The Last Round Up (Hill); Passion Flower (Kennedy). **12.30,**

Dance Music: Forever; Everyone loves my Marguerite; Aromas Mendocinas; The Wedding of Mr. Mickey Mouse; Under a Blanket of Blue; Trouble in Paradise; Ding, Dong, Ding; Sundown in a Little Green Hollow; Signature Tune, The Bells of Normandy; Tick, Tock; Lazybones; Wedding of the Dragonflies; Adorable; Let's all be Happy Together; Spanish Sweetheart; Lover; Here is my Heart; What a Perfect Combination; Elvira; She's Everybody's Sweetheart now; Wood Violets; Let the World go drifting by; I'll show you off; At the Old Pig and Whistle; Dawn in Montmartre; Moths around the Candle Flame; Signature Tune. **2.0,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** See **Langenberg.** **1.30,** Programme for the Hitler Jugend. **2.30,** Weather Report. **2.40,** Time and Market Prices. **3.0,** Concert by a Small Orchestra, conducted by Weilert, and the Darmstadt Madrigal Choir, conducted by Friedrich Noack; Soloists, Karl Joffroy (Harmonium) and Reinhold Merten (Pianoforte); Part I, Orchestral Music; Part II, Harmonium Solos: Adagio (Galuppi); Sarabande (Corelli); Vesper (Bortniansky); Musette (Bach); Part III, Ludwig Erk Memorial Programme: Folk Songs and Memorial Address; Part IV, Duets for Harmonium and Pianoforte (Karg-Elert): (a) Humoresque, Op. 26, No. 1, (b) Quasi Minuetto, Op. 29, No. 5, (c) Kuhreigen, (d) Folk Melody, Op. 31, No. 1; Part V, Orchestral Music. **5.0,** Talk: The German Frontier Problem. **5.20,** Weekly Review. **5.35,** Surprise Programme. **5.50,** News and Announcements. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** Topical Programme. **7.10,** See **Stuttgart. 9.0,** Time and News. **9.20,** Talk by Professor Esau, Rector of Jena University: The Technical Tasks of the Wireless Organisations. **9.35,** Local News and Weather. **9.45,** Light Music. **10.0,** See **Leipzig. 11.0,** See **Stuttgart. 12 Midnight,** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—**3.0 p.m.,** Concert by the Hamburg Philharmonic Orchestra conducted by José Eibenschütz. Overture, Euryanthe (Weber); Forest Murmurs from Siegfried (Wagner); Selection from Peer Gynt (Grieg); Adagio for Strings, Johannisnacht (Engel); Hungarian Rhapsody No. 2 (Liszt); Kaiser-Walzer (Joh. Strauss). **4.0,** Radio Report of the Reich Marine School at Friedrichart, followed by Topical Programme. **4.30,** Variety Programme. **5.35** (from **Kiel**), Religious Address. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.5** till Close Down, See **Berlin (Funkstunde).** In the interval at **9.0,** Time and News. **10.50** (approx.), Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**12.5 p.m.,** Gramophone Concert: Overture, Coriolanus (Beethoven); Danse macabre (Saint-Saëns); Denn alles Fleisch es ist wie Gras (Brahms); Death of Isolda, from Tristan and Isolda (Wagner); Sonata in E minor, Op. 13—the Pathetic (Beethoven); Mariä Wiegenlied (Reger); Andante religioso (Goltermann); Aria from The Valkyrie (Wagner); Aria from The Mastersingers (Wagner); Träumerei (Schumann); Abendlied (Schumann); Arias from Parsifal (Wagner); Hallelujah from Exultate (Mozart). In the intervals at **12.20** and **1.0,** News. **1.30,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices and Exchange. **2.30,** Handwork for Children. **3.0,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Oberto (Verdi); Lyric Suite (d'Albert-Becce); Waltz, Liebeslieder (Joh. Strauss); Selection from Das Nachtlager von Granada (Kreutzer); Overture, The Queen's Kerchief (Joh. Strauss); Visione lirica (Mascagni); Lullaby (Bizet); Selection from The Mikado (Sullivan); Waltz, Der Himmel voller Geigen (Ziehrer). In the interval at **4.0** (approx.), Road Report. **4.40,** Talk on Johann Schimmelpfennig. **5.5,** Programme Announcements. **5.15,** Agricultural Prices. **5.25,** East Prussian Weekly Review. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** News. **7.10,** Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner: Orchestral Suite (Fasch); Divertimento No. 10 (Mozart); First Movement from the Sixth Symphony (Tchaikovsky); Symphonic Poem, Tasso (Liszt); Valse triste (Sibelius); Overture, Phèdre (Massenet). In the interval at **8.0** (approx.). News. **9.0,** News and Sports Report. **9.15** (approx.), Programme from **Berlin (Funkstunde).**

NOV. 25th SATURDAY *continued*

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.** and 20 kW. from **5.40 p.m.** Programme of the Workers' Radio Society (V.A.R.A.).—**11.55 a.m.,** Trio Concert: Extracts from Nell Gwynn (German); An Old Violin (Fischer); L'anneau d'argent (Chaminade); Selection from The Damnation of Faust (Berlioz); Gramophone Records; None but the weary Heart (Tchaikovsky); Spanish Dance (Granados-Kreisler); Piece (Hubay); Ideale (Tosti); Selection from La Traviata (Verdi-Tavan); Gramophone Records; Piece (Codini); Melody (Fyscher); Selection from Les Saltimbanques (Ganne). **1.40 to 1.50 p.m.,** Interval. **1.55,** Gramophone Music. **2.40,** Organ Recital by Jong. **3.10,** Concert by the Rotterdam Philharmonic Orchestra, conducted by Flipse. Soloists: Coba Rinneke (Pianoforte) and Mme. Hendriks-Zalsman (Songs); Dances (Kodaly); Pastoral Suite (Chabrier); Pianoforte Concerto (Ravel). **4.10,** The Adventures of Messrs. Wakker and Tropenduit. **4.30,** Concert (contd.): Piece (Lioba); De drie ruitertjes (Voormolen); Rhapsody, 'Piet Hein (Anrooy). **5.20,** Literary Talk. **5.40,** Concert by the V.A.R.A. Children's Choir, conducted by Tiggers. **6.10,** Concert by The Ramblers. **7.0,** Music by a Double Male Voice Quartet. In the interval, Gramophone Music. **7.37,** S.O.S. Messages. **7.40,** Concert by the V.A.R.A. Orchestra, conducted by de Groot, relayed from **Rotterdam.** Soloists: Mlle. Marie Vos (Soprano) and Flipse (Pianoforte). Overture, William Tell (Rossini); Aria from La Traviata (Verdi); Czardas from Der Geist des Wojewoden (Grossmann); Fantasia on Popular Hungarian Melodies (Liszt); Chromatic Gallop (Liszt); Aria from The Huguenots (Meyerbeer); Tales from the Vienna Woods (Joh. Strauss); Overture, Poet and Peasant (Suppé). **8.55** Talk. **9.5.** Gramophone Music. **9.10,** News. **9.25,** Concert of Light Music, relayed from **Rotterdam. 10.40,** Gramophone Music. **11.40** (approx.). Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.**—Programme of the Catholic Radio Society (K.R.O.). **11.55 a.m.,** Concert by the K.R.O. Sextet. Hungarian Dance No. 5 (Brahms); Babillage (Gillet); Frauenlobgesänge (Spary); Le soir (Thomas); Selection from Rigoletto (Verdi-Tavan); Amoretenreigen (Fucik); Gramophone Music; Waltz (Durand); Chopin Potpourri (Fetras); Melody (Lindern); Ballet Music from La Gioconda (Ponchielli); Music and Roses (Lindern); Waltz (Dvorák); Finale. **1.40,** Programme for Young People. **2.10,** Programme for Children. **3.40,** Concert by the K.R.O. Orchestra, conducted by van 't Woud. Festival Overture (Lentner); Valse triste (Sibelius); Three Irish Pictures (Ansell); Slav Dance (Chabrier). **4.10,** Hand-Writing Lesson. **4.40,** Orchestral Concert (contd.). Rossini Potpourri (Urbach). **4.55,** Sports Talk. **5.10,** Orchestral Concert (contd.). Selection from The Sleeping Beauty (Tchaikovsky); Träumerei (Schumann); Selection from The Gipsy Princess (Kalman). **6.0,** Press Review. **6.25,** Orchestral Concert (contd.). Waltz, Seid umschlungen, Millionen (Joh. Strauss); Potpourri, Bei Lied und Wein (Armandola). **6.40,** Police Notes. **6.55,** Talk. **7.15,** Gramophone Music. **8.5,** News. **8.10,** Political Notes. **10.10,** News. **10.15,** Concert by the K.R.O. Boys, conducted by Lusteuhouwer. Shuffle off to Buffalo (Warren); Gipsy Moon (Borganov); Nach Wien (Robrecht); Tweet, Tweet (Evans); Roses of Picardy (Chapelier); Schiffers Töchterlein (Ivanovici); Mütterlein (Reisfeld); Mein Gorilla (Kaper); Frohsinn auf den Bergen (Fetras); Der Strassenmusikant (Fischer); Ninon (Kaper); Sérénade Andalouse (Bonnet); Finale. In the interval, Gramophone Records. **11.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by **Helsinki, 815 kc/s, 368.1 metres.**—**5.30,** Concert by the Station Orchestra conducted by Erkki Linko. March, In Treue fest (Teike); Finnish Melodies (arr. Herrmann); Ballet égyptien (Luigini); Two Guitars (Horlick); Berceuse (Sarmas); March (Söderman). **6.20,** Talk. **6.40,** Song Recital by Oiva Tammi. **7.0,** Dramatic Programme. **7.45,** News in Finnish. **8.0,** News in Swedish. **8.15,** Dance Music relayed from the Pörssi Restaurant. **10.0** (approx.), Close Down.

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.,** News. **12.35,** Folk Songs and Dances—Concert by the Station Orchestra, conducted by Kühn, and the Station Small Choir, conducted by Breuer. Prelude, Chorus, Ballad and Dance from Das Pensionat (Suppé); Three Folk Songs: (a) Ziege und Bock, (b) Das schlaue Mädchen ,(c) Beim Tanze; Hungarian Dances (Brahms); Three Folk Songs: (a) Die Henne, (b) Spielmann und Mägdelein, (c) Vetter Michel; Waltz, Studentenlust (Joh. Strauss). **1.30,** See **Frankfurt. 2.15,** See **Stuttgart. 2.30,** Market Prices. **2.40,** Sports Notes. **2.45,** Reading. **3.0 to 5.35,** See **Frankfurt. 5.35,** Fiddle Solos. **5.50,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** See **Frankfurt. 7.10 to 9.0,** See **Stuttgart. 9.0 to 9.35,** See **Frankfurt. 9.35,** News and Sports Report. **9.45,** See **Frankfurt. 10.0,** Sports Report. **10.20,** Concert from **Leipzig. 11.0,** See **Stuttgart. 1.0 a.m. (Sunday),** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**12.30 p.m.,** Gramophone Concert. **1.15,** News. **1.30,** Programme for Children. **2.10,** Weekly Review. **2.30,** Agricultural Review. **2.40,** Market Prices and Weather. **3.0,** Lyrics by Conrad Ferdinand Meyer. **3.10,** Discussion: The Doll Factory in Waltershausen. **4.0,** Concert relayed from the Radio Exhibition. **5.0,** Talk: The German Language. **5.20,** Gramophone Records. **5.40,** Topical Talk. **5.45,** To-day's News. **6.0,** Transmission for all German Stations. Handel Concert by the Leipzig Symphony Orchestra and the Male Voice Choir, conducted by Willi Steffen. Soloists: Lotte Mäder-Wohlgemuth (Soprano) and Herbert Neck (Tenor). Concerto grosso No. 7 in C; Ode for St. Cecilia's Day. **7.0 to 9.0,** See **Munich. 9.0,** News and Sports Notes. **10.0,** Concert by the Station Orchestra, conducted by Hilmar Weber. **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**5.0 p.m.,** Gramophone Music and Traffic Report. **5.30,** Talk. **6.0,** Talk on Philosophy. **6.30,** Review of Foreign Affairs. **7.0,** Orchestral Concert with 'Cello Solos. **8.0,** Accordion Solos. **8.30,** Weather and News. **8.50,** Dance Music.

LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW. French Evening.—**7.0 p.m.,** Concerto in G Minor, Op. 22 (Saint-Saëns), on Gramophone Records. **7.25,** Song Recital by Venant Pauké: Ideale (Tosti); Arias (Massenet) from (a) Le Jongleur de Notre-Dame, (b) Manon (c) Thaïs; Arias from Lakmé (Delibes) and The Barber of Seville (Rossini). **7.50,** Talk in French: A Southerner's Impressions of the Grand Duchy of Luxembourg. **8.0,** Concert of French Music by the Radio Orchestra, conducted by Henri Pensis. Soloist: Maurice Lonet (Oboe): Scènes écossaises for Oboe and Orchestra (Godard); Petite Suite (Debussy); Marche militaire (Saint-Saëns). In the interval at **8.30,** Economic and Social Notes. **8.50,** News in French. **9.0,** Variety Concert by the Radio Orchestra and Soloists. **9.50,** News in German. **10.0,** Gramophone Concert: Weber Potpourri (Urbach); Potpourri, Lehàriana (Geiger); Selection from Paganini (Lehár); Selection from The Land of Smiles (Lehár); Melody (Kunnecke); Selection from Great Day (Youmans). **10.45,** Dance Music.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.5 p.m.,** Announcements. **6.25,** See **Warsaw. 6.45,** Sports Notes. **6.47,** See **Warsaw. 8.0,** The Letter Box. **8.20,** See **Warsaw. 9.5,** Cabaret Programme relayed from **Wilno, 530 kc/s, 566 metres. 10.0,** See **Warsaw. 10.5,** Gramophone Music. **11.0** (approx.) Close Down.

LYONS

LA DOUA 644 kc/s, 465.8 metres; 1.5 kW. **7.30 p.m.,** Radio Gazette for Lyons and the South-East. **8.30 p.m.,** An Operetta relayed from **Paris (Ecole Supérieure), 671 kc/s, 447.1 metres.** After the relay, News Bulletin.

MADRID

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—**6.0 to 8.0 p.m.,** Programme for Listeners in the Canary Islands, Guinea and Europe. **6.0,** Popular Concert. **7.15,** Talk. **7.30,** Light Music. **8.0 to 10.30,** Interval. **10.30,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.0,** Dance Music. **11.45,** Light Music. **12 Midnight to 12.30 a.m. (Sunday),** I.B.C. Concert: Trumpets; March and Waltz from The Vagabond King (Friml); Cossack Dance; Scherzo in E Minor (Mendelssohn); Dream Tangles (Schumann); Waltz, The Blue Danube (Joh. Strauss); Volga. **12.30,** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Topical Talk, and Dance Music. **8.15,** Radio Journal. **8.30 to 9.15,** Interval. **9.15,** English Lesson. **9.30,** Chimes, Time, and Radio Journal. **9.45** (approx.). Music Competition: Part I—Song Recital by Dolores de Luque; Arias from Figaro (Mozart); Manon Lescaut (Puccini); and Tannhäuser (Wagner); Copla de antaño (Torroba); Song from El niño judio (Luna); Aria from Faust (Gounod); Part II—Recitation of Poems, with Guitar accompaniment, by Manuel Machado; Part III—Violin Recital by Antonio Piedra; Prelude and Allegro (Pugnani - Kreisler); Chaconne (Bach); Minstrels (Debussy): Bocetо andaluz (Pedro Garcia Morales); Dance from La vida breve (Falla-Kreisler); Andante and Rondo from the Spanish Symphony (Lalo). **11.45,** Radio Journal. **12 Midnight,** Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.25 p.m.,** Quintet Op. 16 (Beethoven) for Oboe, Clarinet, French Horn, Bassoon and Pianoforte. **6.0,** See **Prague. 7.25,** Jazz Music by the Station Orchestra, conducted by Musil. **9.0,** See **Brno. 9.0,** See **Prague. 9.15,** See **Bratislava. 10.30** (approx.), Close Down.

MOSCOW

KOMINTERN, RW1, 202.5 kc/s, 1,481 metres; 500 kW.—**3.15 p.m.,** Musical Programme. **3.30,** Political Review. **4.30,** Red Army Programme. **5.30,** Collective Farms' Programme. **6.30,** Technical Talk. **7.0,** Dramatic Programme with Music by the Radio Orchestra. **8.0,** Talk in German: The Soviet Union. **8.55,** Chimes from the Red Square. **9.5,** Talk in French: Soviet Law. **10.5,** Talk in Spanish: Makhno—the Brigand Chief.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**3.30 p.m.,** Orchestral Concert conducted by Erich Kloss: Prelude to Vision (Lehár); Three Pieces (Mraczek); Selection from I Pagliacci (Leoncavallo); Waltz, Hochzeitsklänge (Schiller); Potpourri, Waldteufeleien (Kling); Intermezzo, Lumpazi-Vagabundus (Siede); Serenade, Il bacio (Micheli); Gallop (Langey). **4.45,** Programme for the Hitler-Jugend. **5.30,** Recital of Modern German Folk Songs by Antonie Wardek. **5.45,** Wireless Notes. **6.0,** Transmission for all German Stations, relayed from **Leipzig. 7.0,** Dance Music with Commentary and Humorous Interludes. **8.0,** Variety Programme. **9.0,** Time and News. **10.0,** See **Leipzig. 11.0** (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres;** and **Rjukan, 671 kc/s, 447.1 metres;** and **Jeløy LCL, 6,990 kc/s, 42.82 metres.**—**3.30 p.m.,** Light Music on Gramophone Records. **4.15,** Programme for Children. **5.15,** Economic Notes. **5.30,** Violin and Song Recital of Norwegian Music. **6.0,** Weather and News. **6.30,** Talk. **7.0,** Time. **7.1,** Light Music and Dance Music by the Station Orchestra, conducted by Kramni. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Cabaret Programme, relayed from **Bergen, 824 kc/s, 364 metres. 10.0,** Gramophone Records of Dance Music. **11.0** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Report, Agricultural Notes and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.25,** Sports Notes, Time and Announcements. **7.45,** La Bambola dell.. Prateria—Operetta in Three Acts (Zerkovitz). After the Operetta, Talk and Book Review. **10.0,** Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.**

(Preliminary and 6-dot Signals).—**5.45 p.m.**, Le Journal Parlé. **7.15**, Weather. **7.25**, News. **7.30**, Three Plays: (a) Scruples (Ostave Mirbeau), (b) Daisy (Tristan Bernard), (c) Interview (Ostave Mirbeau). **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.**, Gramophone Music. **7.15**, Le Journal Parlé. **7.30**, Light Music on Gramophone Records. **7.50**, Talk: The Event of the Week. **8.0**, Theatre Talk. **8.30**, Sponsored Programme. **9.20**, Guessing Competition—Who is it? **9.35**, Dance Music on Gramophone Records. **11.0**, News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.**, Physical Culture. **7.30**, Weather and Physical Culture. **7.45**, Gramophone Records: Valentine (Christiné); Waltz (Fietter); Dolorita (Dufas); La Czarine (Ganne). **8.0**, Press Review and Weather. **9.30**, Concert by the Concert Society, relayed from the Old Conservatoire; The Orchestra, conducted by Gaubert; Soloists, Martial Singher (Songs) and Gerard Hekking ('Cello); Faust Symphony (Liszt); 'Cello Concerto (Schumann); Scherzo from Romeo and Juliet (Berlioz); Songs and Orchestral Selection from The Damnation of Faust (Berlioz). **11.30**, Interval. **12.0 Noon**, Gramophone Concert: Viva Cuba (Curti-Muscat); Per Aspera ad Astra (Urbach); Viennese Melody (Messier); Tu m'as juré (Matis-Lenoir); Alabama (Marceau); You are my Heart's Delight (Lehár-Waltham); Melody (de Bozi-Cools); Serenata (Monti); Visages jaunes (Messier); Colo-Colotte (Marwys); Chloe (Moret); Glow-worm Gavotte (Lincke); Oh, Mademoiselle Marguerite (Llossas); Miami (Loyraux); Prince Charming (Pares-van Parys); Inch, Allaha (Padilla); Air (Nelly-Laurent-Halet); Eternel Printemps (Popy); The Vagabond's Song (Richmann); Joujou (Fischer); J'ai deux amours (Scotto); Adoration (Philippon); There's a Girl in Havana (Goety-Sloane); Bandoeon (Maffia y Spiana); Aubade (Livshakov); Je n' penx pas vivre san toi (Oberfeld); La Renversée (Mola-Rualten); The Wave (Metra); Le chapeau (Noel); Singing in the Rain (Brown); Mon Village du Tyrol (Marceau); A quoi bon (Oberfeld); La Mousmée (Kramer-Agatov); Vous dansez, Marquise (Lemaire); Melody (Jekill-Haly). In the intervals at **1.0 p.m.**, Exchange, News and Weather; at **1.30**, Exchange. **2.0**, Exchange. **3.0**, Programme for Children. **3.45**, Exchange and Market Prices. **6.20**, Talk on Honey. **6.45**, Gramophone Records: Lynette (Paradis); Lucienne (Curti); L'Amour fleuri (Danjaume). **7.0**, Talk: Great Days of the Revolution: 18th Brumaire. **7.20**, Gramophone Music: Operetta Potpourri (Misraki); C'est Jean de la Lune (Augé); Locuras (Alongi); Lake Michigan (Heymann); Küssen ist kein' sund (Eysler); L'âme des visions (Lawrence-de Buxeuil-Febure); Les vieil·es Larmes (Millandy); Hymne à l'Infanterie de Marine (Cappé). **7.45**, Latin Press Review. **8.0**, Programme of Songs. In the intervals at **8.30**, News and Weather; at **8.40**, Review by Dorin; and at **9.15**, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 to 10.30 p.m., New York** Relay. **7.0**, Musical Originalities. **7.30**, Dance Masters. **7.45**, Army-Navy Game. **10.30**, A Recreo—Bill and Alex. **10.45**, Orphan Annie, from **New York.** **11.0**, News by Pat Haley. **11.15**, Sports Notes and Programme Preview. **11.30**, Evensong. **11.45**, Programme to be announced. **12 Midnight**, Happy Felton's Orchestra. **12.30 to 3.0 a.m. (Sunday), New York** Relay. **12.30**, Trio Romantique. **12.45**, O'Leary's Irish Minstrels. **1.0**, Waldorf Astoria Orchestra. **1.30**, Sous les Ponts de Paris. **2.0**, Jamboree. **3.0**, Behind the Law.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.**, See **Brno.** **3.50**, Educational Talk for Young People. **4.15**, Talk on Commerce. **4.25**, Gramophone Music. **4.35**, Czech Lesson for German Listeners. **4.50**, Gramophone Music. **5.5**, Agricultural Programme. **5.15**, Talk for Workers. **5.25**, News in German. **6.30**, German Transmission: Talk with Gramophone Illustrations; Foreign Lands. **6.0**, Time, News and Weather. **6.10**, Talk: Diphtheria. **6.25**, The Miller and his Child—Radio Sequence (Jurist). **7.25**, See **Moravska-Ostrava.** **8.0**, See **Brno.** **9.0**, Time, News, Review of the Day and Sports Notes. **9.15**, See **Bratislava.** **10.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres, 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28**, Time Signal from Neuchâtel Observatory. **11.30**, News and Weather. **11.40** (from **Lausanne**), Tourist Report. **11.45** (from **Lausanne**), Gramophone Concert. **12 Noon** (from **Lausanne**), Financial Notes. **12.5 p.m.** (from **Lausanne**), Gramophone Concert (contd.). **12.45** (from **Lausanne**), Announcements and Answers to Correspondence. **1.0**, Interval. **2.58**, Time Signal from Neuchâtel Observatory. **3.0** (from **Lausanne**), Concert of Light Music and Jazz Music by the Small Radio-Lausanne Orchestra. **3.45**, Concert relayed from **Lugano.** **5.0** (from **Geneva**), Programme for Children. **5.20** (from **Geneva**), Talk for Young People. **5.40** (from **Geneva**), Talk on Films. **5.55** (from **Geneva**), Talk. **6.30** (from **Geneva**), Radio Chronicle. **6.59** (from **Geneva**), Weather Report. **7.0** (from **Geneva**), Concert of Modern Music by the Pro Nova Group: Nocturnes for Violin, Viola and Pianoforte (Strong); Rhythmic Studies for Violin (Martinů). **7.25** (from **Geneva**), Humorous Programme. **7.45** (from **Geneva**), Variety Programme by the Melody Dance Orchestra, and Madame Berlie. **8.50** (from **Geneva**), News and Weather. **9.0** (from **Geneva**), Dance Music on Gramophone Records. **10.30** (approx.), Close Down.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**6.0 p.m.**, Weather. **6.5**, Choral and Orchestral Concert. In the interval at **7.0**, News. **8.0**, Weather and News. **8.35**, Modern Dance Music. **9.0**, Old Dance Music. **10.0** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.**; and **2RO, 11,810 kc/s, 25.4 metres.**—**12 Noon to 1.15 p.m.**, Orchestral Concert: Melody (Salter); Serenatella timida (Tonelli); Lyric in blue (Escobar); Balletto rustico (Mulè); Selection from La Gioconda (Ponchielli); Bimbi di nessuno (Rampoldi); Rumba, Bruna Madonna (Lopez); Melody (Nicholls). **3.30**, Children's Radio Review. **3.55**, Giornale Radio, and Report of the Royal Geographical Society. **4.10**, Weather. **4.15**, Orchestral Concert: Lonesome and blue (Nissim); Memorie (Petralia); Melody (Frey); Seduzioni (Balisi); Rhapsody, España (Chabrier); Waltz, Solo un'ora (Di Ferdinando); In a Chinese Temple Garden (Ketelbey); Isabella of Castile (Bootz). **5.40 (Naples)**, Shipping and Sports Notes. **5.45**, Lesson in Morse and Dopolavoro Report. **6.0**, Tourist Report. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Giornale Radio. **7.0**, Time and Announcements. **7.30**, Giornale Radio and Sports Notes. **7.45**, An Opera (to be announced); Talk and Scientific Review in the intervals; Giornale Radio after the Opera.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.**—**7.0 p.m.**, Football Game. **12.45 a.m. (Sunday)**, Stock Reports. **1.0**, Variety Programme. **1.30**, Antobal's Cubans, from **New York.** **1.45**, Popular Programme. **2.0 to 4.0, New York Relay.** **2.0**, Baron Munchhausen; Orchestra; Soloists. **2.30**, Lea Reisman's Orchestra; Yacht Club Boys. **3.0**, Saturday Night Dancing Party. **4.0**, Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres, 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 to 6.5 a.m.** (from **Berne**), Gymnastics. **9.20** (from **Zürich**), Broadcast for Schools. **9.50 to 11.0**, Interval. **11.0** (from **Berne**), Gramophone Music. **11.29**, Time Signal from Neuchâtel Observatory, Weather, and News. **11.40** (from **Berne**), The Week in the Federal Assembly. **11.50** (from **Berne**), Light Music on Gramophone Records. **12.15 p.m.** (from **Berne**), Song Recital. **12.25** (from **Berne**), Time, Weather, and Exchange. **12.30** (from **Basle**), Request Programme. **12.45** (from **Basle**), Book Review. **1.15** (from **Basle**), Programme for Children. **2.0 to 2.29**, Interval. **2.29**, Time Signal from Neuchâtel Observatory. **3.0** (from **Basle**), Accordion Music on Gramophone Records. **3.45**, Concert relayed from **Lugano.** **5.0** (from **Basle**), Opera and Operetta Music on Gramophone Records. **5.30** (from **Basle**), Programme for Women. **6.0**, Chimes from Zürich Churches. **6.15** (from **Basle**), Time, Weather and Market Prices. **6.20**, Talk: The Origin and Development of Radio. **6.50** (from **Basle**), Introductory Talk to the Following Transmission. **7.0** (from **Basle**), Symphony Concert, relayed from the Musiksaal. **9.0** (approx.), Weather and News. **9.10** (from **Basle**), Dance Music on Gramophone Records. **10.0** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**3.0 p.m.** (from **Göteborg**), Light Orchestral Music: March, Hail to the Spirit of Liberty (Sousa); Waltz, Les Sirènes (Waldteufel); Romance (Grünfeld); Selection from The Girl of the Golden West (Puccini); Gavotte (Gillet); Sèlection from The Merry Widow (Lehár). **4.5**, Programme for Children. **4.45**, Gramophone Music. **5.45** (from **Göteborg**), Talk: The Swedish Language. **6.15**, Weather and News. **6.30**, Variety Programme. **7.30**, A Concert in 1897; the Station Orchestra, conducted by Hjalmar Meissner; Soloist, Olle Björling (Songs); Talk by Hjalmar Meissner: Overture, Les Saltimbanques (Ganne); Serenade (Moszkowsky); Potpourri (arr. A. Meissner); Songs with Horn Quartet Accompaniment; A Tour Round Old Stockholm; Marche lorraine (Ganne); Waltz, Estudiantina (Waldteufel); Violin, Harp and Orchestra: Ave Maria (Bach-Gounod); Rhapsody No. 1 (Liszt). **8.45**, Weather and News. **9.0**, Dance Music. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.**, Light Music on Gramophone Records. **12.45 p.m.**, News. **1.0**, Time. **1.1**, Orchestral Concert of Variety Music, conducted by Roskam. **2.0**, Legal Talk in German. **2.15**, Light Music on Gramophone Records. **3.0**, Talk on Music. **3.15**, Interval. **4.0**, Concert of Chamber Music: String Quartet: Piece in G (Presle); Viola and Pianoforte Sonata (Moutfeuillard); First String Quartet (Mozart). **5.0**, Symphony Concert by the Pasdeloup Concert Society, relayed from the Théâtre des Champs Elysées, Paris. **7.0**, French Lesson. **7.15**, Agricultural Talk. **7.30**, Time and News. **7.45**, Gramophone Music. **8.0**, Press Review in German, Lottery Results and Announcements. **8.30**, Gramophone Music. **8.45 to 11.0**, Programme by the Society of War Orphans of Eastern France, relayed from Nancy. **8.45**, Talk: Marshal Foch. **10.0**, Interval. **10.15**, "Concert" for Pianoforte, Violin and String Quartet. **11.15**, Press Review. **11.20**, Dance Music, relayed from the Savoy. **12 Midnight** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.25 p.m.**, Local News and Weather. **12.35**, See **Langenberg.** **1.30**, See **Frankfurt.** **2.15**, Morse Lesson. **2.30**, Gramophone Records. **3.0 to 5.35**, See **Frankfurt.** **5.35**, Talk: The Goldsmiths' and Silversmiths' Industry. **5.50**, Time, Agricultural Report, and Weather. **6.0**, Transmission for all German Stations, relayed from **Leipzig.** **7.0**, See **Frankfurt.** **7.10**, Variety Concert. **8.10**, Concert by the Station Orchestra, conducted by Gustav Görlich. **9.0 to 9.35**, See **Frankfurt.** **9.35**, Local News, Weather, and Sports Report. **9.45**, See **Frankfurt.** **10.0**, See **Leipzig.** **11.0**, Serenade. **1.0 a.m. (Sunday)**, Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—**6.0 p.m.**, News. **6.15**, Instrumental Music: Serenade (Gounod); Obenlied (Schumann); Souvenirs (Nicholls); Ständchen (Schubert). **6.30**, Opera Music: Duet from Le chalet (Adam); Duet from Le peau de chagrin (Carré); Aria from Lakmé (Delibes). **6.45**, Accordion Solos. **7.0**, Chansonnettes. **7.15**, News. **7.30**, Music by a Viennese Orchestra. **7.45**, Choral Music. **8.0**, Orchestral Music: Valse de Phryné (Ganne); Country Fair (Filipucci); Selection from The Duchess of Chicago (Kálmán); Melody (Zeller). **8.15**, Extracts from Sound Films. **8.30**, Opera Music: Overture, Norma (Bellini); Selection from Cavalleria rusticana (Mascagni); Clair de lune from Werther (Massenet). **8.45**, Light Music. **9.0**, Concert Version of La fille de Madame Angot—Operetta (Lecocq). **9.30** (approx.), Military Music: Alexander's March (Léonchart); March of the Cadets (Sousa); Piece (Holzmann); March from Carmen (Bizet). **9.45** (approx.), Songs. **10.0**, Chamber Music. **10.15**, News. **10.30**, Concert for Listeners in Morocco: Part I: Chansonnettes; Part II: Instrumental Music: Overture, Poet and Peasant (Suppé); Melody (Rubinstein); Extase (Ganne). **11.0**, Request Music: Aria from Mirella (Gounod); Selection from Les cloches de Corneville (Planquette); Melody; Aria from Tosca (Puccini). **11.15**, Dance Music. **12 Midnight**, News. **12.5 a.m. (Sunday)**, Opera Music: Duet from Aida (Verdi); Aria from Der Freischutz (Weber). **12.15**, Organ Recital: Ballet égyptien (Luigini); Prelude in E minor (Bach). **12.30** (approx.), Close Down.

TRIESTE

1,221 kc/s, 247.7 metres; 10 kW.—**4.10 p.m** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.**, Gramophone Concert: Symphonic Poem, Die Moldau (Smetana); La mer (Debussy); Classical Symphony in D (Prokofiev). **5.0 to 5.5**, Weather. **5.40**, Giornale Radio, Dopolavoro Report and Gramophone Music. **6.0**, Time, Tourist Report, and Gramophone Music. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Gramophone Music. **7.0**, News and Weather. **7.25**, Talk: Events and Problems. **7.40**, Variety Programme. **8.45**, Review of New Books. **9.0**, Dance Music. **10.0**, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW. —**10.0 to 10.15 a.m.**, Religious Announcements in Various Languages. **7.0 to 7.15 p.m.**, Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.**, Orchestral Concert, conducted by Recktenwald: Selection from Cavalleria rusticana (Mascagni); Serenade (Czibulka); Love's Dream after the Ball (Czibulka); Selection from Paganini (Lehár); Potpourri of Viennese Schrammel Music (Recktenwald). **12 Noon**, Time, Weather, and Announcements. **12.10 p.m.**, Gramophone Concert of Famous Artists. **2.0**, Time, Weather, and Exchange. **2.15**, Talk in French: La Légende du Roi d'Ys. **2.45**, Concert by the Vienna Mandoline Society, conducted by Schmidhuber: Overture, Tancred (Rossini); La Serenata del Paggio (Nani); Minuet from the Second Suite from L'Arlésienne (Bizet); Three Pieces (Grieg): (a) Albumblatt, (b) Berceuse, (c) Elfentanz; Tanz der Tecpuppen (Bass); In a Persian Market (Ketelbey); Egyptian Serenade, Amina (Lincke). **3.25**, Recitations. **4.0**, Max Egger Concert for his Seventieth Birthday by the Vienna Male Voice Choir. **4.30**, Talk: Mistakes in Speech. **5.0**, Topical Programme. **5.30**, Concert by the Wiener Symphoniker, conducted by Nilius: Overture, Fra Diavolo (Auber); Ballet Scene (Glazunov); Two Slav Dances (Dvorak); Waltz, Künstlerleben (Strauss); Two Hungarian Dances (Brahms); Variations on a Hungarian Folk Song (Zador). **6.50**, Time, Weather, and Announcements. **7.0**, To-day's Motto. **7.5**, Der Kellermeister—Operetta in Three Acts (Zeller). **9.20**, News and Exchange. **9.35**, Gramophone Concert, followed by Exchange.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.**, Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5**, Concert by the Adamska-Grossmann Orchestra. **11.30**, Radio Journal. **11.35**, Weather. **11.38**, Orchestral Concert (contd.). **12 Noon**, Interval. **2.30**, Economic Notes. **2.40**, Choral Music on Gramophone Records. **2.55**, Aviation Report and Anti-Gas Drill. **3.0**, Programme for Invalids, relayed from **Lwów, 788 kc/s, 381 metres.** **3.40**, French Lesson. **3.55**, Concert by the Station Orchestra, conducted by Nawrot; Soloist, Zabczynski (Songs): March (Blon); Waltz, Gold and Silver (Lehár); Songs; Chinese Rhapsody (Gabriel-Marie); Songs; Gallop (Joh. Strauss); Waltz, Danube Pearls (Vollstedt); Lisonia (Armandola); Mazurka (Kurpinski). **4.50**, Agricultural Notes, relayed from **Wilno, 630 kc/s, 566 metres.** **5.0**, Talk. **5.20**, Song and Pianoforte Recital of Jazz Music by Olga Lada (Soprano) and Altenberg and Rybczynski (Pianoforte). **6.0**, Programme Announcements. **6.5**, Miscellaneous Items. **6.25**, Reading. **6.40**, Sports Notes. **6.47**, Radio Journal. **7.0**, Concert by the Station Orchestra, conducted by Oziminski; Soloist, Marie Ronska (Soprano): Overture, Verbum Nobile (Moniuszko); Mazurka (Godard); Two Norwegian Dances (Grieg); Two Arias from Il Trovatore (Verdi); Selection from Lakmé (Delibes); Soprano Solos: (a) The Enchanted Princess (Niewiadomski), (b) Deception (Szopski), (c) Two Songs (Opienski); Arab Dance from Harun al Rashid (Lutoslawski). **8.0**, Answers to Correspondence. **8.20**, Pianoforte Recital of Polish Music by Wojtowicz: Sonata in E flat minor (Paderewski); Three Polish Dances (Wojtowicz). **9.5**, Programme from **Wilno.** **10.3**, Aviation Weather Report and Police Notes. **10.5**, Dance Music from the Italia Café.

WILNO

530 kc/s, 566 metres; 16 kW.—**6.25 p.m.**, Talk for Students. **6.40**, See **Warsaw.** **6.45**, Miscellaneous Announcements. **6.47**, See **Warsaw.** **7.0**, Request Gramophone Records. **8.0**, See **Warsaw.** **9.5**, Cabaret Programme. **11.0** (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender.**

NOV. 25th SATURDAY *continued*

PRINCIPAL BROADCASTING STATIONS OF EUROPE

Arranged in Order of Wavelength

Metres.	kc/s.	kW.	Station.	Tuning Positions.
1935	155	7	Kaunas (Kovno) (Lithuania)	
1875	160	8.5	Huizen (Holland) (*Kootwyk*, 50kW., *after 3.40 p.m.*) (*K.R.O. and N.C.R.V. programmes.*)	
1796	167	40	Lahti (Finland)	
1725	174	75	Radio Paris, CFR	
1635	183.5	60	Berlin (Deutschlandsender) (Germany). (*S.-W. Stn. DJA on 31.38 m., DJB on 19.73 m., DJC on 49.83 m., DJD on 25.51 m., DJE on 16.86 m.*)	
1554.4	193	30	Daventry National	
1538	195	7	Ankara (Angora) (Turkey)	
1481	202.5	500	Moscow, RV1 (Russia) (*S.-W. Stn. on 25m.*)	
1446	207.5	13	Eiffel Tower, FL, Paris	
1412	212.5	120	Warsaw I (Poland)	
1380	217.5	100	Novosibirsk, RV76 I (Russia)	
1348	222.5	30	Motala (Sweden). (*Relays Stockholm*)	
1304	230	100	Moscow, WZSPS (Trade Union) (Russia)	
1200	250	5	Stamboul (Turkey)	
1200	250	21	Reykjavik (Iceland)	
1190	252	200	Luxembourg	
1170	256	25	Tashkent, RV11 (Russia)	
1154	260	60	Kalundborg (Denmark). (*Relays Copenhagen*)	
1154	260	20	Monte Ceneri (Switzerland).	
1117	268.5	40	Moscow, Popoff RV58 (Russia)	
1083	277	60	Oslo (Norway)	
1071	280	35	Tiflis, RV7 (Russia)	
1035	290	36	Kiev, RV9 (Russia)	
1000	300	100	Moscow RV39 (Russia). (*S.-W. Stn. on 50 m.*)	
938	320	20	Kharhov. RV4 (Russia)	
857	350	100	Leningrad (Russia)	
840	357	18.5	Budapest (Hungary)	
825	363.6	50	Sverdlovsk, RV5 (Russia)	
750	400	1.3	Geneva (Switzerland). (*Relays Sottens*)	
720	416.6	20	Moscow, RV2 (Experimental) (Russia)	
690	434.6	1.5	Oulu (Uleaborg) (Finland)	
574.7	522	0.7	Hamar (Norway) (*Relays Oslo*)	
574.7	522	7	Ljubljana (Yugoslavia)	
570	527	0.25	Freiburg (*Relays Muhlacker*)	
568.1	528	2	Grenoble (France)	
560	536	1.5	Kaiserslauten and Augsburg (*Relay Munich*)	
550	545	18.5	Budapest No. 1 Lakihegy (Hungary)	
542	554	10	Sundsvall (Sweden). (*Relays Stockholm*)	
537.6	558	3	Palermo (Italy)	
533	563	60	Munich (Germany)	
525	571	15	Riga (Latvia)	
517.2	580	100	Vienna (Bisamberg) (Austria)	
509	589	15	Brussels No. 1, Velthem (Belgium). (*In French*)	
501.6	598	20	Florence, IFI (Italy) (*Relays Turin*)	
495.8	605	1.2	Tröndelag (Norway)	
493.4	608	16	Wilno (Poland). (*Relay Station*)	
488.6	614	120	Prague (Czechoslovakia)	
480	625	50	North Regional (Manchester)	
472.4	635	60	Langenberg (Germany)	
465.8	644	1.5	Lyons la Doua, PTT (France)	
459.4	653	60	Beromünster (Schweizerischer Landessender) (Switzerland).	
453.2	662		San Sebastian, EAJ8 (0.6 kW.); Pori (1.0 kW.) (Finland); Klagenfurt (0.5 kW.) (Austria) (*relays Vienna*).	
453.2	662	0.25	Agen (France)	
453.2	662	4	Milan (Vigentino) (Italy). (*Relays Rome*)	
451.8	664	20	Madona (Latvia). (*Relays Riga*)	
447.1	671	0.5	Danzig (*Relays Heilsberg*)	
447.1	671	7	Paris, Ecole Supérieure, PTT	
441.2	680	50	Rome, IRO. (*S.-W. Station, 2RO on 25.4 m.*)	
435.4	689	55	Stockholm, SASA (Sweden)	
430.4	697	2.5	Belgrade (Yugoslavia)	
424.3	707	2	Madrid, EAJ7 (Union Radio)	
424.3	707	100	Moscow, Imini Stalina (Russia)	
419.5	715	1.5	Berlin, Funkstunde (Germany)	
416.4	720.5	5	Rabat (Morocco)	
413	725	60	Athlone (Irish Free State)	
408.7	734	16	Katowitz (Poland)	
403.8	743	25	Sottens (Radio Suisse Romande) (*Switzerland*)	
398.9	752	25	Midland Regional (Daventry)	
394.2	761	12	Bucharest (Roumania)	
389.6	770	120	Leipzig (Germany)	
385.1	779	8	Toulouse (Radiophonie du Midi) (France)	
385.1	779	10	Stalino, RV26 (Russia)	
381	788	16	Lwow (Lemburg) (Poland)	
376.4	797	50	Scottish Regional (Falkirk)	
372.2	806	1.5	Hamburg (Germany)	
370.1	810.5	0.8	Radio, LL, Paris	
368.1	815		Seville, EAJ5 (Union Radio) (1.0 kW.); Galicia EAJ4 (0.2 kW.) (Spain); Bolzano (1.0 kW.) (Italy); Helsinki (10 kW.) (Finland) (*relays Lahti*); Kharkov, RV20 (10kW) (Russia).	
368.1	815	0.7	Fredriksstad (Norway). (*Relays Oslo*)	
364.1	824	1	Bergen (Norway)	
363.6	825	13	Algiers (Algeria)	
360.6	832	60	Mühlacker (Stuttgart) (Germany)	
355.9	843	50	London Regional (Brookmans Park)	
352.1	852	7	Graz (Austria). (*Relays Vienna*)	
348.8	860	7.6	Barcelona, EAJ1 (Spain)	
348.8	860	10	Leningrad, RV70 (Russia)	
345.2	869	11.5	Strasbourg, PTT (France)	
341.7	878	35	Brno (Brunn) (Czechoslovakia)	
338.2	887	15	Brussels II Velthem (Belgium). (*In Flemish*)	
335	896	5	Cadiz (Spain)	
334.4	897	1.9	Poznan (Poland)	
331.5	905	50	Milan (Italy). (*Relays Turin*)	
328.2	914	60	Poste Parisien (France)	
325	923	60	Breslau (Germany)	
321.9	932	10	Göteborg (Sweden). (*Relays Stockholm*)	
318.8	941	0.25	Dresden (Germany). (*Relays Leipzig*)	
318.8	941	1.5	Naples, INA (Italy). (*Relays Rome*)	
315.8	950	1.6	Marseilles, PTT (France)	
312.8	959	1.7	Cracow (Poland)	
312.8	959	10	Genoa, IGE (Italy). (*Relays Turin*)	
309.9	968	50	West Regional (Washford Cross)	
307	977	0.7	Radio Vitus (Paris). (*S.-W. Stn. on 43.75 m.*)	
307	977	0.75	Zagreb (Yugoslavia)	
304	986	13	Bordeaux Lafayette, PTT (France)	
301.5	995	50	North National (Manchester)	
298.8	1004	11	Tallinn (Estonia)	
296.1	1013	20	Hilversum (Holland). (*7 kW. before 4.40 p.m.*) (*V.A.R.A., A.V.R.O. and V.P.R.O. programmes.*)	
293.5	1022	0.7	Limoges, PTT (France)	
293.5	1022	2.6	Kosice (Czechoslovakia)	
291	1031	13.2	Viipuri (Viborg) (Finland). (*Relays Helsinki*)	
288.3	1040	50	Scottish National (Falkirk)	
288.3	1040	1	Bournemouth. (*Relay Station*)	
286	1049	0.8	Montpellier (France)	
284.8	1053	0.7	Lyons (Radio-Lyon) (France)	
283.6	1058	0.5	German Relays (Berlin, Magdeburg, Stettin)	
283.6	1058	0.5	Innsbruck (Austria). (*Relays Vienna*)	
282.2	1063	2	Lisbon CT 1AA (Portugal). (*Short-wave Station on 31.25 m.*)	
281.2	1067	0.75	Copenhagen (Denmark)	
278.8	1076	13.5	Bratislava (Czechoslovakia)	
276.5	1085	60	Heilsberg (Germany)	
273.7	1096	7	Turin (Italy)	
271.5	1105	1.3	Rennes, PTT (France)	
269.8	1112	20	Bari (Italy) (*Relays Rome*)	
267.6	1121	0.75	Valencia (Spain)	
267.4	1122	6.25	Nvireghaza (Hungary). (*Relays Budapest*)	
265.8	1128.5	1.3	Lille, PTT (France)	
263.8	1137	11.2	Moravska Ostrava (Czechoslovakia)	
261.5	1147	50	London National and West National	
259.3	1157	17	Frankfurt-a.-M. (Germany)	
259.3	1157	2.3	Trier and Cassel. (*Relay Frankfurt*)	
257.1	1167	10	Hörby (Sweden). (*Relays Stockholm*)	
255.1	1176	0.7	Toulouse, PTT (France)	
253.1	1185	5	Gleiwitz (Germany). (*Relays Breslau*)	
252	1193	1	Barcelona, EAJ15 (Assoc. Nat.) (Spain)	
249	1205	0.8	Juan-les-Pins, Nice (France)	
247.7	1211	10	Trieste (Italy). (*Relays Turin*)	
245.9	1220		Berne (0.5kW.) (Switzerland) (*relays Beromünster*); Eskilstuna (0.2kW.), Säffle (0.4 kW.) (Sweden) (*relays Stockholm*); Linz (0.5 kW.) (Austria) (*relays Vienna*); Turku (Abo) (0.5 kW.) (Finland) (*relays Helsinki*).	
244.1	1229	0.5	Basle (Switzerland). (*Relays Beromunster*)	
242.3	1238	1	Belfast (N. Ireland)	
240.6	1247	0.5	Stavanger (Norway)	
238.9	1256	2	Nürnberg (Germany). (*Relays Munich*)	
238	1260	1	Nimes (France)	
237.2	1265	3	Bordeaux, Sud-Ouest (France)	
235.5	1274	0.5	Kristiansand (Norway)	
233.8	1283	1.65	Lodz (Poland). (*Relay Station*)	
232.2	1292	0.25	Kiel (Germany). (*Relays Hamburg*)	
230.6	1301	—	Swedish Relay Stations	
227.4	1319		Flensburg, Bremen and Hanover. (*Relay Hamburg*)	
225.9	1328	10	Fécamp, Radio-Normandie (France)	
224.4	1337	1	Cork (Irish Free State)	
219.9	1365	1.5	Béziers (France)	
218.5	1373	0.2	Plymouth	
218.5	1373	0.5	Salzburg (Austria). (*Relays Vienna*)	
217	1382	0.5	Königsberg (East Prussia). (*Relays Heilsberg*)	
214.3	1400	1	Aberdeen	
211.3	1420	1	Newcastle	
209.8	1430	1.25	Magyarovar, Miskolc and Pecs (Hungary)	

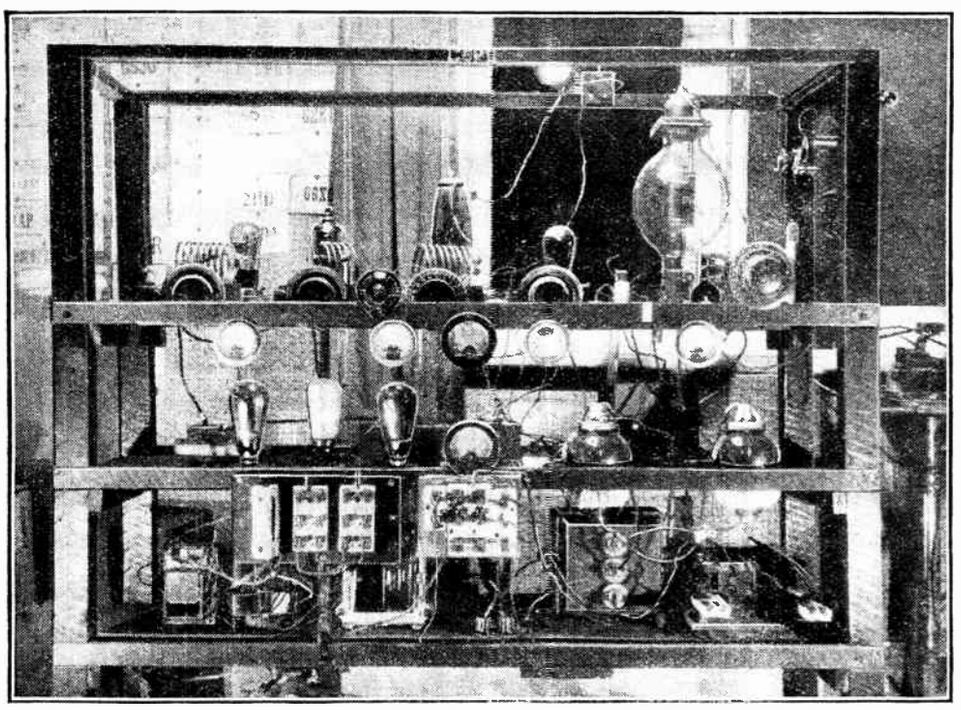
SHORT-WAVE STATIONS OF THE WORLD

(N.B.—Times of Transmission given in parentheses are approximate only and represent G.M.T.)

Metres.	kc/s.	Call Sign.	Station.	Tuning Positions.
62.56	4,795	VE9BY	London, Ont. (Canada). (*Sun.* 06.00) ...	.....
58.31	5.145	OK1MPT	Prague (Czechoslovakia). (*Tues. and Fri.* 19.30)	.....
50.26	5,970	HVJ	Vatican State, Rome. (*Daily* 19.00) ...	.....
50.0	6,000	RW59	Moscow. (*Relays Komitern Stn.*)... ...	.....
50.0	6,000	EAR25	Barcelona, Radio Club (Spain). (*Sat.* 20.00)	.....
49.83	6,020	DJC	Zeesen (Germany)	.....
49.67	6,040	W1XAL	Boston, Mass. (U.S.A.)	.....
49.64	6,040	W4XB	Miami Beach, Florida (U.S.A.)	.....
49.6	6,048	W3XAU	Philadelphia, Pa. (U.S.A.). (*Relays WCAU*)	.....
49.58	6,050	GSA	Empire Broadcasting	.....
49.5	6,060	VQ7LO	Nairobi (Kenya Colony). (*Daily* 16.30)...	.....
49.5	6,060	W8XAL	Mason, Ohio (U.S.A.). (*Relays WLW*) ...	.....
49.43	6,069	VE9CS	Vancouver, B.C. (Canada)	.....
49.40	6,075	OXY	Skamleback (Denmark). (*Relays Copenhagen*)	.....
49.34	6,080	W9XAA	Chicago, Ill. (U.S.A.). (*Relays WCLF*)...	.....
49.22	6,095	VE9GW	Bowmanville, Ont. (Canada). (*Daily* 20.00)	.....
49.2	6,098	ZTJ	Johannesburg (S. Africa). (*Weekdays* 09.00) 14.00 [*Sat.* 14.30] *and* 17.00, *Sun.* 13.00 *and* 16.30.)	.....
49.18	6,100	W3XAL	Bound Brook, N.Y. (*Relays WJZ*) ...	.....
49.1	6,110	VUC	Calcutta, India. (*Daily* 13.00)	.....
49.02	6,120	W2XE	Wayne, N.J. (U.S.A.). (*Relays WABC*)...	.....
48.86	6,140	W8XK	East Pittsburg, Pa. (U.S.A.). (*Relays KDKA* 21.19–06.00)	.....
48.8	6,147	VE9CL	Winnipeg (Canada). (*Daily ex. Sun.* 00.30)	.....
47.97	6,250	HJ3ABF	Bogota (Colombia). (*Daily* 15.00) ...	.....
48.05	6,243	HKD	Barranquilla (Colombia). (*Weekdays* 23.45)	.....
48.0	6,250	CN8MC	Casablanca (Morocco). (*Relays Rabat*) ...	.....
47.0	6,382	HC1DR	Quito, Ecuador. (*Daily* 01.00)	.....
46.69	6,425	W3XL	Bound Brook, N.J. (U.S.A.). (*Relays WJZ*)	.....
45.38	6,611	RW72	Moscow. (*Relays Stalin Stn.*)	.....
45.0	6,667	FM8KR	Constantine (Algeria). (*Mon. and Fri.* 22.00)	.....
45.0	6,667	TGW	Guatemala City (Central America). (*Daily* 03.00)	.....
43.75	6,860	—	Radio Vitus, Paris. (*Daily* 20.30) ...	.....
43.0	6,970	EAR110	Madrid. (*Tues. and Sat.* 22.30)	.....
41.7	7,195	VS1AB	Singapore (Malay States). (*Sun. and Wed.* 15.30)	.....
40.3	7,443	HBQ	Radio Nations, Prangins (Switzerland) (*Sun.* 22.00–22.45)	.....
38.47	7,797	HBP	Radio Nations, Prangins (Switzerland). (*Sat.* 22.30–23.15)	.....
37.33	8,936	CNR	Rabat (Morocco). (*Sun.* 21.00)	.....
37.04	8,110	HCJB	Quito (Ecuador)	.....
33.50	8,955	TGX	Guatemala City (S. America)	.....
31.58	9,500	PRBA	Rio de Janeiro (Brazil). (*Daily* 21.30) ...	.....
31.55	9,510	VK3ME	Melbourne (Australia). (*Wed. and Sat.* 10.00)	.....
31.54	9,510	GSB	Empire Broadcasting	.....
31.48	9,530	W2XAF	Schenectady, N.Y. (U.S.A.). (*Relays WGY*)	.....
31.38	9,560	DJA	Zeesen (Germany). (*Daily* 22.00) ...	.....
31.35	9,570	W1XAZ	East Springfield, Mass. (U.S.A.). (*Relays WBZ*)	.....
31.3	9,580	HBL	Radio Nations, Prangins (Switzerland). (*Sat.* 22.00–22.45)	.....
31.29	9,585	GSC	Empire Broadcasting	.....
31.28	9,585	W3XAU	Philadelphia, Pa. (U.S.A.). (*Relays WCAU*)	.....
31.28	9,590	VK2ME	Sydney (Australia). (*Sundays*)	.....
31.25	9,598	CT1AA	Lisbon (Portugal). (*Tues. and Fri.* 22.00–00.00)	.....
31.0	9,675	T14NRH	Heredia (Costa Rica). (*Daily* 22.00 *and* 02.00)	.....
30.0	10,000	EAQ	Aranjuez (Spain). (*Daily* 22.30, *Sat.* 18.00)	.....
28.98	10,350	LSX	Buenos Aires (Argentina). (*Daily* 20.30)	.....
26.83	11,180	CT3AQ	Funchal (Madeira). (*Tues. and Thurs.* 10.30–12.30)	.....
25.63	11,705	FYA	Pontoise (France). (*Colonial Stn. E-W, daily* 20.30)	.....
25.6	11,720	VE9JR	Winnipeg (Canada). (*Daily* 14.30) ...	.....
25.57	11,730	PHI	Eindhoven (Holland)	.....
25.53	11,750	GSD	Empire Broadcasting	.....
25.5	11,760	DJD	Zeesen (Germany)	.....
25.45	11,790	W1XAL	Boston, Mass. (U.S.A.)	.....
25.4	11,810	2RO	Prato Smeraldo, Rome. (16.15–23.30) ...	.....
25.36	11,830	W2XE	Wayne, N.J. (U.S.A.). (*Relays WABC*)...	.....
25.34	11,840	W9XAA	Chicago, Ill. (U.S.A.). (*Relays WCFL*) ...	.....
25.28	11,865	GSE	Empire Broadcasting	.....
25.27	11,870	W8XK	East Pittsburg, Pa. (U.S.A.). (*Relays KDKA* 21.19–03.00)	.....
25.25	11,880	FYA	Pontoise (France). (*Colonial Stn. N-S*) ...	.....
23.38	12,830	CNR	Rabat (Morocco). (*Sun.* 12.30)	.....
19.9	15,075	T14NRH	Heredia (Costa Rica). (*Sat., Sun., Mon.* 16.00 *and* 21.00)	.....
19.84	15,120	HVJ	Vatican State, Rome. (*Daily* 10.00) ...	.....
19.81	15,140	GSF	Empire Broadcasting	.....
19.73	15,200	DJB	Zeesen (Germany). (*Daily* 13.00–22.30)...	.....
19.72	15 210	W8XK	East Pittsburg, Pa. (U.S.A.). (*Relays KDKA* 15.00–21.18)	.....
19.68	15,244	FYA	Pontoise (France). (*Colonial Stn. E-W*)...	.....
19.64	15,270	W2XE	Wayne, N.J. (U.S.A.). (*Relays WABC*)...	.....
19.57	15,330	W2XAD	South Schenectady, N.Y. (U.S.A.). (*Daily* 20.00)	.....
16.89	17,760	DJE	Zeesen (Germany)	.....
16.88	17,770	PHI	Eindhoven (Holland)	.....
16.87	17,780	W3XAL	Bound Brook, N.J. (*Relays WJZ*) ...	.....
16.86	17,790	GSG	Empire Broadcasting	.....
16.57	18,105	W9XAA	Chicago, Ill. (U.S.A.). (*Relays WCFL*) ...	.....
13.97	21,470	GSH	Empire Broadcasting	.....
13.92	21,540	W8XK	East Pittsburg. (12.00–19.00)	.....
12.30	24,380	VE9GW	Bowmanville, Ont. (Canada)	.....

G 5PJ

An Active Amateur Transmitter



This station, constructed by Mr. C. G. Phillips at Northwood, Middlesex, operates on the 7, 14 and 28 megacycle wavebands, and has established communication with all parts of the world. Crystal-controlled drive is used and the various stages can clearly be seen in the photo.

BLUE PRINTS

For the convenience of constructors full-sized blue prints are available of the following popular *Wireless World* sets that have been recently described, price 1s. 6d., post free.

Short Wave Two. (November 4th and December 23rd, 1932.)

Monodial D.C. Super. (December 2nd and 9th, 1932.)

Straight Three. (December 16th, 1932.)

Modern D.C. Three. (December 30th, 1932, and January 6th, 1933.)

All-wave Monodial Super. (January 27th and February 10th, 1933.)

Modern A.C. Quality Amplifier. (February 17th, 1933.)

Ferrocart III. (February 24th and March 3rd, 1933.)

The Class "B" Ferrocart Receiver. (April 17th, 1933.)

Universal A.C. Short-wave Converter. (April 28th, 1933.)

New Monodial Super. (July 21st and 28th, 1933.)

Modern Battery Four. (August 11th, 1933.)

D.C. Superhet. (September 29th, and October 6th, 1933).

A.V.C. Three. (October 13th and 20th, 1933).

These can be obtained from the Publishers, Iliffe & Sons Ltd., Dorset House, Stamford Street, London, S.E.1.

THE VITAL FACTS

EVERY wireless user can be a "walking encyclopedia" if he carries with him a *Wireless World* Diary for 1934. The Diary tabulates all the new European wavelengths and includes receiver maintenance record pages, abacs for instantaneous calculations, useful formulæ, wireless symbols and tested circuit diagrams, in addition to practical hints and comprehensive valve tables. It is obtainable from all booksellers, price 1s. 6d., or from our Publishers, Dorset House, Stamford Street, London, S.E.1, price 1s. 7d., post free.

Broadcast Brevities

By Our Special Correspondent

The New Birmingham Studios

ALTHOUGH, technically speaking, the new studios at Broad Street, Birmingham, are not entirely completed, they are now in regular use. They are lofty windowless rooms, ventilated by suction, heated by radiators, and decorated in the best modern traditions of Broadcasting House.

The principal studio, No. 4, measures 46ft. by 38ft. and is 21ft. high at the loftiest point of the curved ceiling. There is concealed lighting and two spot lights. At a recent orchestral concert the studio accommodated forty-nine players and the conductor.

From the Director's Room

Small orchestra concerts, plays, children's programmes are broadcast from No. 2 studio on the top floor. Other studios serve for talks, effects, and children's hours.

Strangely enough, the more distinguished visitors do not speak from a talks studio, but are privileged to address the microphone in the Regional-Director's room.

Gratitude

I MET John MacDonnell, in the main entrance to Broadcasting House, staggering under the weight of a bulging parcel of congratulatory correspondence, apropos that most successful production of his, "Good Evening."

MacDonnell's programmes seem to evoke an unusual quality of gratitude among his listeners, for he told me that parcels had been arriving filled with such good things as jellied chicken, apples, pears, nuts of every description, not to mention several pairs of kippers.

Severe Strain

No other broadcaster prompts such gifts. No wonder MacDonnell is "overrr-whelmed," as he put it. Broadcasting can impose severe strains on the constitution.

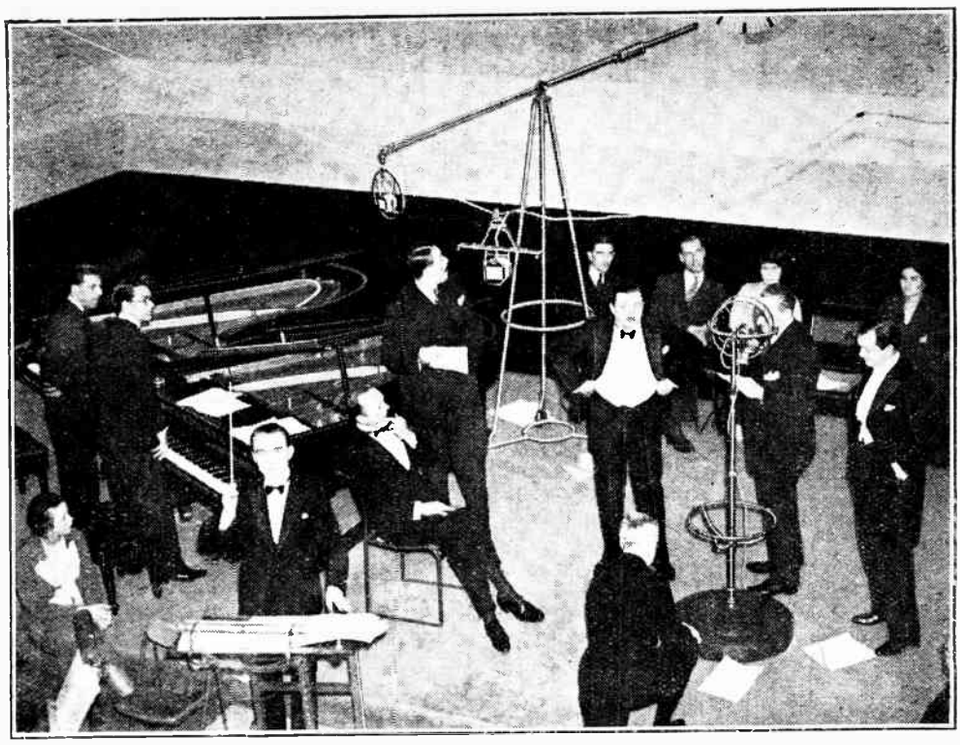
Strange Clash

ON several recent occasions, when listening to London National, I have heard a faint background of speech or music broadcast from the Regional transmitter. My set, a "*Wireless World* Ferrocart III," cuts out both stations within a fraction of a degree. The B.C.C. engineers inform me that induction between the lines in the control room or at Brookmans Park is of the rarest occurrence. Can there be any other solution of the mystery?

If other readers have experienced the same trouble I should be very glad to hear their comments.

No Fuss

NO great misery has been occasioned by the synchronisation between London and West National. Indeed, the total number of reports of "wavering" has been only thirty-two, of which only four came from the London area.



THE CAMERA IN THE STUDIO. A striking photograph taken at Broadcasting House last week during the actual transmission of "Good Evening." John MacDonnell, producer, is to the left of the microphone, while Christopher Stone introduces Bobby Howes (right) to the listening public.

Deceiving the Public

IS the B.B.C. guilty of a breach of faith when the voices of eminent artistes are broadcast without any announcement that a gramophone record is being used? A pretty question, much easier to ask than to answer.

At all events, the thing is done, and done often, but only in one case, so far as I am aware, has a deliberate attempt been made to persuade listeners that they were hearing an actual "flesh and blood" effort by the artiste in question.

The Facts

This was during that very successful programme, "C. B. Cochran Presents," when everything was done and said to indicate that the listener was being switched through to the actress's dressing-room at the Adelphi Theatre between acts. The little trick was successfully carried out, but the real truth was that, far from being hurried and harried by the importunate call boy whom we heard in the background, Miss Gertrude Lawrence recorded her staccato greetings comfortably and quietly two days before.

"Good Night, Vienna."

AFTER nearly two years, Holt Marvell's romantic operetta "Good Night, Vienna" returns to the microphone on December 6th (Regional) and December 7th (National). The music is by George Posford, while Val Gielgud, the B.B.C.'s Director of Drama, will act as producer.

"Good Night, Vienna" requires eleven studios. It has already made a very successful film; indeed, it was this piece that showed the affinity between broadcast technique and that of the screen.

Variety on Trial

A MOCK trial in which "Radio Variety" will be in the box is to be featured by Rex Evans in his next "Merry-go-round" programme on November 26th. Each act in turn will enter the witness box and plead his own defence. Evans will be judge.

The Cause list contains such names as John Tilley, Jeanne de Casalis, Elizabeth Pollock, and Elizabeth Welch, now appearing in "Nymph Errant."

Future Features

"THE Three Musketeers" will be broadcast in December.

* * *

The Café Colette orchestra, whose origin—Paris, Brussels, Vienna or Marseilles?—no one knows, will make a public appearance at the St. George's Hall in a "Music Hall Broadcast" on November 25th.

* * *

From Bombay on December 13th a special programme will be relayed to British listeners, thanks to the co-operation of the Indian State Broadcasting Service. Items will include Indian vocal and instrumental music by native artistes, a commentary on a typical street scene in Bombay, and greetings to the Home country.

* * *

An eye-witness account of the International Association Football match between Scotland and Austria will be broadcast from the Glasgow studio on November 29th.

* * *

November 30th, St. Andrew's Day, is to be celebrated at Scottish Broadcasting House in grand style.

Every Day a Flag Day

IT is only right that Admiral Sir Charles Carpendale should be in charge of the flags at Broadcasting House. This business of flying the right flag at the right time grows more onerous from day to day. Distinguished visitors drop in at any old time, and sometimes Sir Charles must despatch his lieutenants to the nearest flag shop at a moment's notice.

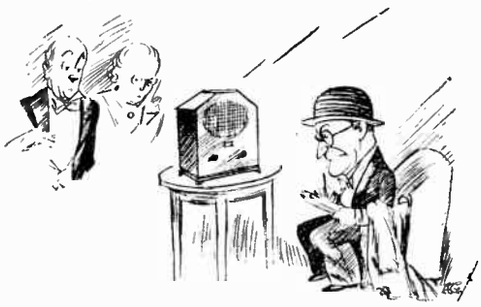
Flags to Order

Flags in stock include the Royal Standard, the Union Jack, the Stars and Stripes, the B.B.C. House Flag, and one or two miscellaneous emblems for dull days.

UNBIASED
BY FREE GRID

Tripe and Onions

RECENTLY I was called in by a wretched cousin of mine to investigate a mysterious form of interference which afflicted all the receivers in her suburban neighbourhood from about 6.30 to 7 on certain evenings. I was fortunate, inasmuch that the interference appeared on the very first evening on which I listened



T-R-I-P-E A-N-D O-N-I-O-N-S.

for it. At once I recognised it to be a morse message, obviously emanating from some form of spark transmitter and containing a mysterious demand for "two pairs of kippers," repeated over and over again.

Two evenings went by without any further messages, and then came a peremptory demand for tripe and onions, repeated for upwards of half-an-hour. From time to time other requests of a like nature have been made in the same manner, but I must confess that I am at present completely baffled and no nearer the solution than when I first commenced to investigate the mystery.

Unless I receive helpful suggestions from clever but kind-hearted readers I fear that I shall have to confess myself beaten, a thing which I am naturally very loath to do, as it will mean a considerable loss of prestige in the eyes of my cousin.

Gas Manager's Troubles—III

THOSE readers who were reading these notes as long ago as last winter and who, like Mr. Micawber, are still desperately hanging on in the hope that something better will turn up, may probably remember that in the first 1933 issue of this journal I related the radio troubles of an unfortunate gas manager in a certain provincial town. It will be remembered that he was denied the benefits of a mains set owing to the fact that his narrow-minded directors refused to countenance the presence of electric light in his house.

Being old and well stricken in years, quite apart from the fact that he was fed up with the action of his company, he has, since that date, quite properly decided to put radio before everything else, and so has retired.

After the finish of the Cambridgeshire the other day I took a brisk walk over to his new house. It was a distinctly modern dwelling, but to my surprise it contained old-fashioned gasoliers.

I was still more astonished, however, when, after lighting the gas with a match in the usual way, my friend told me in confidence that actually electric light *was* used, but that everything had been designed to make it look like gas lighting. There was even the necessity of using a match, and the presence of miniature electric light bulbs of high candle power with gas mantles draped over them.

I frankly confessed to him that I thought the use of a match was all eye-wash and that actually the turning of a gas tap operated an electric switch. In reply he invited me to try to light up without a match, and I found that I could not do so; even when I did hold the necessary match to the inverted gas fitting, and the light suddenly came on, I frankly did not see how it worked.

invited me to try.

Explanations were soon forthcoming, and such a tale of misplaced ingenuity was unfolded to me as I have seldom met in a somewhat wide experience of this world and its wicked ways. He had, he explained, considered the question of using the tap as a switch, and, indeed, such it was; but, fearful of being unmasked in a moment of forgetfulness by lighting up without a match, he had included in series with it a miniature thermal delay switch, which was heated by the match. Once the light was on, there was, of course, sufficient heat developed to hold the switch over until the "gas" was turned off by the tap.

He explained to me that, after spending so many years of his life in urging his fellow citizens to use gas, he felt that he could not be so callous as to let them see that he really preferred electricity himself, and so he had done his best to keep up the illusion. Once again, I thought, "conscience doth make cowards of us all."

My Radio Course for Pinheads—I

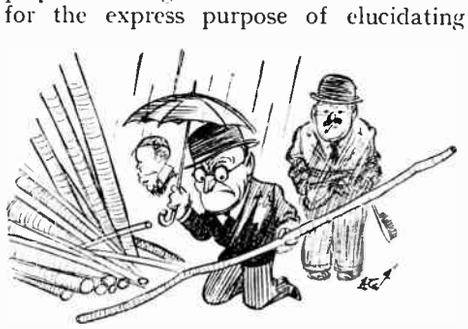
ONE of the most important components of a wireless installation is the aerial pole, for without it we should all be compelled to stand out in the garden and hold the aerial up ourselves whenever we wish to receive anything, and on these chilly winter evenings that would never do, would it?

Choosing an aerial pole is an even more important task than choosing a receiver, and in order to carry it out properly we should go to a builder's yard. Here there will usually be found a whole pile of them, resting after their fatiguing task of holding up the house until the wallpaper is put on, which is their normal avocation. As a consequence of the tiring nature of their workaday lives, some of them will be curved, i.e., not quite perpendicular or "straight," as the best people say. Since nothing that is not quite straight and above board must be tolerated in the matter of wireless, we must take great care how we choose our pole.

We must drop down on our hands and knees and squint along each pole to see how far each one has strayed from the path of rectitude; and what one of us has not strayed at one time or another, even if it be only the teeniest, teeniest bit?

Having made our choice, the kind-hearted builder's-foreman will immediately lend us a clothes brush, for we shall have soiled our trousers somewhat, shall we not? We can now return home to a nice hot tea, filled with that inward glow which alone comes of the consciousness of a good deed well done.

P.S.—If you find the above instructions too difficult, don't hesitate to write and tell me so, or rather write to the Editor, and he will pass the word on to the world-famed technical engineers whom he employs in his great research laboratories for the express purpose of elucidating



Choosing the Rod, Pole or Perch.

these problems for you. They will then be able, after years of patient research, to discover a simpler method for you to carry out this exacting task. But remember the old school motto and never give up.

Television Explained

IV.—The Requirements for a Good Image

ONE of the chief difficulties found in television development is the enormous sideband spread of the transmitter, for a single television station may occupy as much space in the ether as sixty telephony transmitters. The reasons for this are explained in this article, and it is pointed out that the future of television lies in the ultra-short waveband.

THE fundamental methods of television transmission and reception have been explained in the preceding articles of this series, and with some knowledge of how the apparatus functions we can now consider the requirements for good results. There are two things which we must first decide—the picture frequency and the number of scanning lines. The greater the number of pictures transmitted a second the less likely we are to be troubled by flicker, and cinema practice tells us that we need not go above about twenty-four pictures a second for practically perfect results. The greater the number of scanning lines used the better will be the definition and detail.

Now the higher the picture frequency and the more lines used the higher will be the modulation frequencies required in the transmitter and the greater will be its sideband spread. It is here that the greatest practical difficulty is to be found, and so the first step is to determine the highest frequency required. Let us suppose that we wish to transmit a chessboard in which the black and white squares are the same size as the hole in the scanning disc or its equivalent. The variations in light and shade for a single scanning line are shown at (a) in Fig. 1, and the corresponding photo-cell current at (b). In this particular case eighteen squares are shown of which nine are black and nine are white. There are, therefore, eighteen changes in the value of current through the cell. This current, however, may be regarded as an alternating current superimposed upon a steady direct current, as shown at (c), in which the line AB represents the steady current for this type of picture. It will be seen that one complete alternation of current occupies the time from X to Y, and for eighteen squares there are nine such alternations.

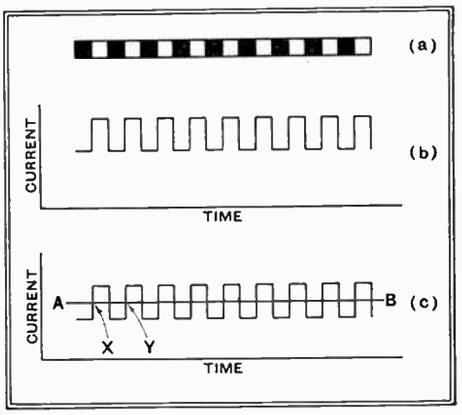


Fig 1.—A series of black and white squares (a) gives rise to a photo-cell current of the type shown at (b). This is equivalent to a direct current, represented by AB in (c), with a superimposed alternating current.

Maximum Modulation Frequency

If the whole picture is a chessboard such as this, therefore, we might say that the maximum frequency required is equal to the number of pictures a second multiplied by one-half of the total number of squares. Now a high quality half-tone block will have a screen of perhaps 100, corresponding to 10,000 elements per square inch. If the size of the picture be 5in. by 6in., its area is 30 sq. in., and with a screen of 100 there will be a total of 300,000 picture elements. In a television transmission, one-half of this number multiplied by a picture frequency of 25 leads to a maximum modulation frequency in the transmitter of 3,750,000 cycles. The transmitter sideband spread, therefore, would be 7,500,000 cycles.

A telephony transmitter of roughly equal quality would require a total sideband spread of no more than 20,000 cycles, so that a single television transmitter would occupy as much space in the ether as 375 telephony transmitters. Moreover, transmission could not be carried out at all on frequencies below 3,750,000 cycles, or wavelengths above 80 metres.

In practice, the highest frequency required is not so readily calculated, for the picture is not divided into a definite number of elements as in the case of a half-tone block. The maximum frequency is dependent upon the maximum rate of change of light, and this in turn depends upon the type of picture being transmitted. If the picture contains strong black and white contrast with a sharp dividing line, the frequencies needed will be higher than if it is delicately shaded with the whites merging gradually into the blacks.

Present Transmissions

The chessboard pattern which we have assumed is one requiring the highest frequencies, and represents the worst possible case. Even so, the frequencies required are likely to be as much as three times those calculated above on account of the presence of a strong third harmonic in the photo-cell current.

The present B.B.C. transmissions fall far below this ideal, of course, for there are only 30 lines and $12\frac{1}{2}$ pictures a second. The ratio of height to breadth of the picture is 7:3, so that if we take the condition of the transmission of a chessboard 70 squares in height by 30 squares in width, the fundamental maximum frequency will be $12\frac{1}{2} \times 70 \times 30/2 = 14{,}100$ cycles. It is believed that the maximum frequency transmitted at present is in the neighbourhood of 13,000 cycles. It is evident, therefore, that the present transmissions could just deal with a chessboard of the type described, provided that the photo-cell current involved no harmonics. As the current will always include harmonics, they will be absent in the receiver and the image will not show the sharp dividing lines between the squares which are characteristic of a chessboard, but the white and black squares will merge into one another through shaded areas.

One would expect, therefore, on these theoretical grounds that the present transmissions would be of little practical value. This is not so, however, for the reason that as severe a test as a chessboard rarely occurs in practice. Whatever the area of the objects involved, a sudden change from black to white necessitates equally high frequencies, but as in the practical case these sudden changes occur less frequently, the defects are correspondingly less noticeable.

A Practical Compromise

At the present time perfection appears almost impossible, and it is necessary to decide the maximum modulation frequency that can be used in practice and the minimum frequency which will give an acceptable performance with real enter-

The fact that the photo-cell current does not change instantaneously leads to a blurring of the received image which is accentuated by a loss of extremely high frequencies. This is well brought out in this illustration.

Television Explained—

tainment value. This is hardly a matter which can be decided at present, but the writer has seen pictures with a ratio of height to breadth of 5:6 transmitted with a picture frequency of 25 and with 120 lines, and in his opinion there can be no doubt of the entertainment value of such an arrangement. The results are far from perfection, of course, but they are so good that it is easily possible to forget that the picture is televised and to lose oneself in the programme. A system of this nature involves frequencies of $25 \times 144 \times 120/2 = 126{,}000$ cycles, and, taking into account the inevitable harmonics, frequencies up to 300 kc/s are needed.

The lowest frequency required is a matter of some importance, but in general this need not be below the picture frequency. With the B.B.C. transmissions, therefore, the receiver must operate over the range of $12\frac{1}{2}$ to 13,000 cycles, and with the really high quality system from 25 cycles to 300,000 cycles.

It will be immediately apparent that the design of a low-frequency amplifier to cover the latter range is a matter of no little difficulty, particularly as phase distortion is a matter of some importance. L.F. transformers, of course, are ruled out, and it is usual to employ resistance-capacity coupling modified by the inclusion of corrective networks to compensate for the inevitable high note loss due to stray capacities.

In transmission, however, the presence of modulation frequencies up to 300,000 cycles leads to difficulties owing to the sideband spread of the transmitter, for a single station will occupy as much space as sixty present-day broadcasting stations. It is apparent, therefore, that television transmitters of this type can only work on the ultra-short wavelengths around 5 metres; there is no room for them anywhere else.

It is probably this question of the high modulation frequencies involved that has limited the growth of television more than anything else. High quality television will not appear until the technique of transmission and reception on 5 metres is more fully developed.

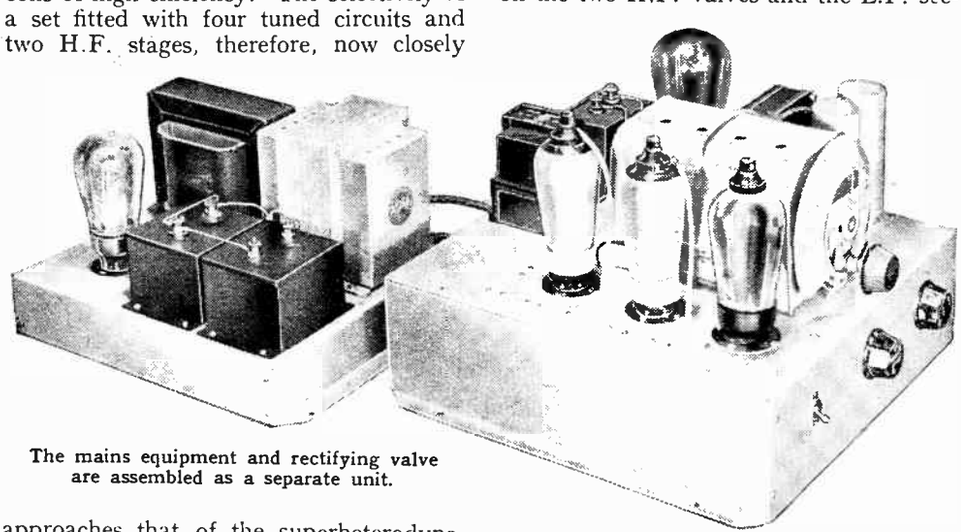
In Next Week's Issue :—

"The Wireless World"

A.V.C. STRAIGHT FOUR

An A.C. Mains Quality Set for the Critical Ear

IN spite of the popularity of the superheterodyne the straight set still retains many adherents, and its disadvantage of poorer selectivity has been largely removed by the development of iron-core coils of high efficiency. The selectivity of a set fitted with four tuned circuits and two H.F. stages, therefore, now closely approaches that of the superheterodyne.



The mains equipment and rectifying valve are assembled as a separate unit.

Advantage has been taken of this development, therefore, in designing the A.V.C. Straight Four, and the two variable-mu H.F. pentodes which provide the H.F. amplification are associated with four iron-cored coils which are so tapped that optimum selectivity is obtained. The tuning system is a combination of band-pass and cascade circuits to avoid a loss of the upper audible frequencies.

A duo-diode-pentode valve acts as the detector and the L.F. stage, while providing automatic volume control operative on the two H.F. valves and the L.F. section of the duo-diode-pentode. The coupling to the output valve, which is of the 25-watts type capable of delivering nearly 6 watts to the speaker, is by means of a high-grade transformer.

Constructionally, an assemblage on metal chassis is adopted in the case of both receiver and power units, thus greatly facilitating the mounting of components in their correct relative positions.

High Standard of Quality

The sensitivity and selectivity are adequate for most normal requirements, while the quality of reproduction reaches a very satisfying standard. The volume obtainable is ample for all domestic purposes.

A.V.C. STRAIGHT FOUR

THE LIST OF PARTS.

Receiver Unit

1 4-gang condenser — Polar "Star Minor"
1 Dial for above — Polar "Full-Vision" Semicircular Drive
1 Set of 4 Ferrocart coils on chassis, consisting of F.10, F.11, F.12 and F.13 — Colvern
3 Screened H.F. chokes — Bulgin H.F.9
2 Electrolytic condensers, 8 mfds., 450 volts peak working — Dubilier (Peak, T.C.C.)
1 Fixed condenser, 2 mfds., 550 volts, D.C. working, in rectangular metal container — Dubilier L.C.G.
1 Fixed condenser, non-inductive, 2 mfds., 250 volts, D.C. working, in cylindrical aluminium container — Dubilier 9200
2 Fixed condensers, non-inductive, 1 mfd., 250 volts, D.C. working, in cylindrical aluminium containers — Dubilier 9200
7 Fixed condensers, non-inductive, 0.1 mfd., 250 volts, D.C. working, in cylindrical aluminium containers — Dubilier 9200
1 Resistor, 30 ohms — Claude Lyons "Humdinger"
1 Wire-wound resistance, 7,500 ohms, 20 watts — Bulgin PR.10
1 Resistance, 100 ohms, 1 watt — Erie
1 Resistance, 500 ohms, 1 watt — Erie
1 Resistance, 500 ohms, 3 watts — Erie
2 Resistances, 600 ohms, 1 watt — Erie
2 Resistances, 1,000 ohms, 1 watt — Erie
1 Resistance, 2,000 ohms, 1 watt — Erie
1 Resistance, 5,000 ohms, 1 watt — Erie
1 Resistance, 10,000 ohms, 1 watt — Erie
2 Resistances, 20,000 ohms, 1 watt — Erie
1 Resistance, 50,000 ohms, 1 watt — Erie
1 Resistance, 500,000 ohms, 1 watt — Erie
1 Resistance, 1 megohm — Erie
3 Resistances, 2 megohms — Erie
(Dubilier, Graham Farish, Claude Lyons, Scradex.)
1 Tapered volume control, 250,000 ohms (Claude Lyons, Watmel.) — Magnum
1 L.F. transformer, 1 : 3½ — Ferranti AF5
1 L.F. choke, 20 henrys, 60 mA. — R.I. DY51
4 Valve holders, 5-pin — Clix Chassis Mounting Standard Model
1 Valve holder, 7-pin — Clix Chassis Mounting Floating Model
1 Double-pole changeover switch — Bulgin S.98
1 On-off toggle switch — Bulgin S.102
1 On-off toggle switch (Claude Lyons.) — Bulgin S.80
1 5-way connector — Wilburn
1 5-way battery cable, with twin 70/36 leads — Harbros
2 5-pin plugs — Bulgin P.3
2 Knobs — Bulgin K.14
4 Ebonite shrouded terminals, A., E., pick-up (2) — Belling-Lee "B"
2 Lengths screened sleeving — Harbros
1 Metal chassis, complete with screws, nuts and washers — Haynes Radio
6 Lengths Systoflex, 2 ozs. No. 20 tinned copper wire, etc.
Valves:—2 Mullard VP4, or Ferranti VPT4, 1 Cossor DD/Pen., 1 Mazda PP5/400 or Marconi or Osram PX25.

Power Unit

1 Mains transformer, Primary: 200 to 250 volts, 50 cycles; secondaries: 450-0-450 volts, 120 mA. 4 volts 2.5 amp. centre-tapped; 4 volts 5/6 amp. With screened primary. — Bryce AB573/2
1 L.F. smoothing choke 26 henrys, 120 mA., 140 ohms, D.C. resistance. — Savage "Massicore" RC27M
2 Fixed condensers, 4 mfds., 550 volts, D.C. working, in rectangular metal containers — Dubilier L.C.G.
2 Valve holders, 5-pin — Clix Chassis Mounting Standard Model
1 5-way connector — Wilburn
1 Metal chassis, complete with screws, nuts and washers — Haynes Radio
2 Lengths Systoflex, 1 oz. No. 20 tinned copper wire, etc.
1 Loud speaker, with 5,000 ohms field, and high impedance speech coil for PP5/400 valve — Baker's S.P.D. Black Cone
Valves:—1 Marconi or Osram MU14.

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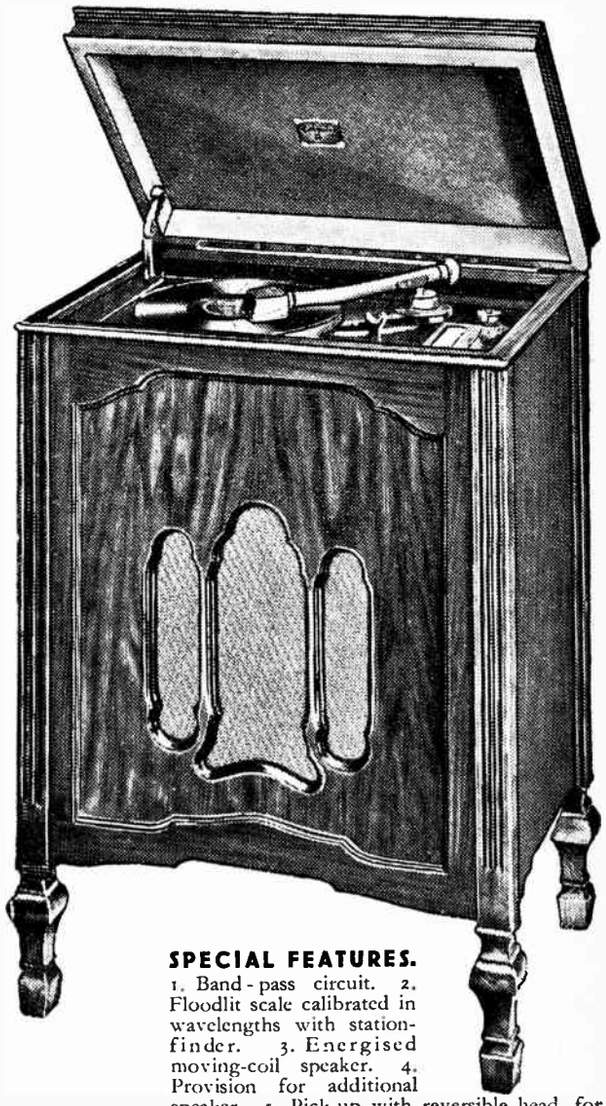

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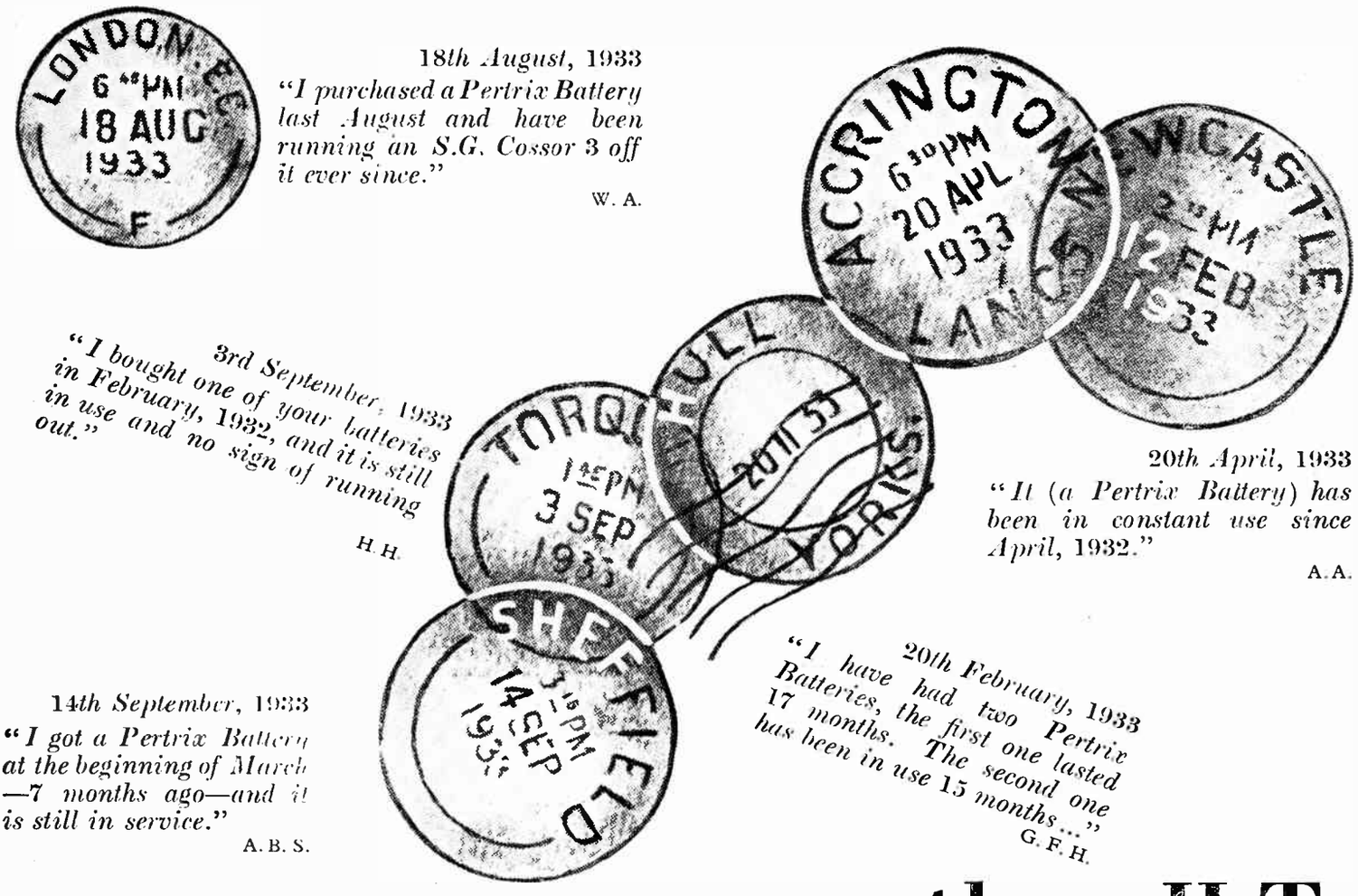

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"I purchased a Pertrix Battery last August and have been running an S.G. Cossor 3 off it ever since."
W. A.

"I bought one of your batteries in February, 1932, and it is still in use and no sign of running out."
3rd *September*, 1933
H. H.

20th *April*, 1933
"It (a Pertrix Battery) has been in constant use since April, 1932."
A. A.

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20th *February*, 1933
G. F. H.

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"I got a Pertrix Battery at the beginning of March —7 months ago—and it is still in service."
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Tone Compensating Devices

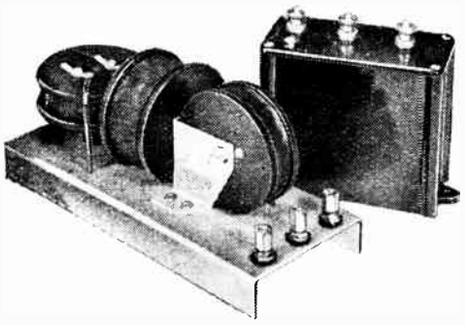
Units that Improve Record Reproduction

THE fidelity of modern gramophone recording is now so good that by using a carefully corrected pick-up and an amplifier of straight line characteristics the reproduction can be brought exceedingly near to the original. Several weak links, however, still exist in the chain between the performers and the listeners. These are not all in the reproducing apparatus, and one by one they are being strengthened.

Bulgin scratch filter choke.

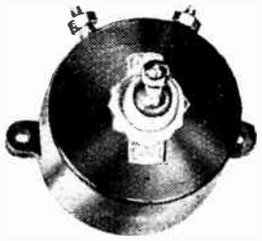
In the conversion from mechanical to electrical energy, and then back again to mechanical, in the form of sound waves, many inequalities appear, and it is with a view to smoothing out these that the technician has brought to his aid tone compensating devices.

The average gramophone pick-up is a fairly complicated electrical structure, but it may for simplicity be regarded as a generator in series with a resistance and an inductance. Therefore the simplest of all tone correctors would be a condenser, for at a certain frequency the inductance and the capacity will form a resonant circuit and result in a peak appearing on the response curve, but this is followed by a sharp cut off. Similarly a pronounced peak could be depressed by some other combination. One that would serve this purpose was described in our issue of October 27th last.



Wearite low pass filter and whistle filter.

A more common arrangement is to join a condenser and a resistance, or a choke, across the primary winding of the output transformer, and if the resistance is made variable the amount of correction is then brought under control.

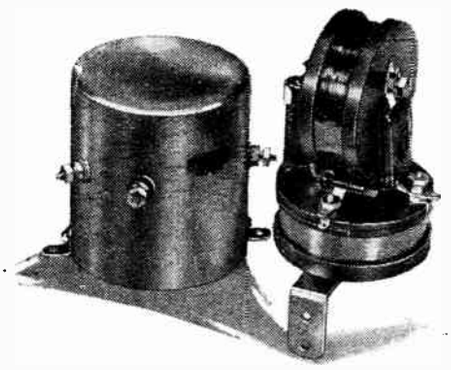


Goltone tone control giving option of two cut-off points.

There are several devices on the market, either designed for, or which could be made to serve the purpose of eliminating needle scratch. Any filter giving a sharp cut off at a frequency just below that where record surface noises become troublesome can be utilised. One example is the Bulgin Scratch Filter Choke, and which is joined directly across the pick-up terminals. This gives a cut-off at about 4,000 c/s.

In the Wearite range are two Heterodyne Whistle Filters and one Low Pass Filter that would be applicable to this case. The whistle filters cut off at 3,500 c/s and 5,000 c/s respectively, while the Low Pass Filter is a somewhat more complicated arrangement, but gives a very sharp attenuation above 3,500 c/s.

Further examples are the Kinva "Steepslope" and "Sideband" splash filters, the A3 model in the former style cutting off at 3,500 c/s, while the "D" 2 "Sideband" splash filter gives the option of two end points, the one at 3,500 c/s and the other at 4,500 c/s.



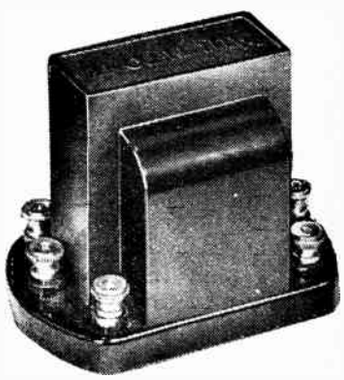
Kinva type "D"2 dual range filter and the A3 model.

The Goltone P.A. Tone Control has claims for inclusion in this class, although it was designed in the first case to moderate the high note response of a pentode.

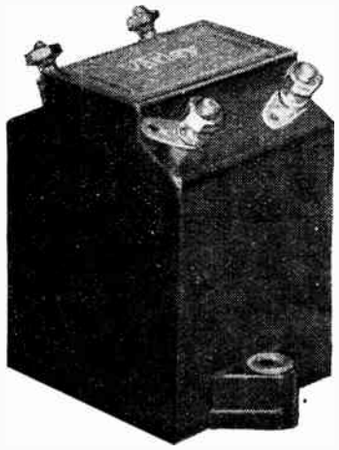
The filters so far mentioned are all of the fixed or semi-fixed type designed to curtail the frequency response at some predetermined point on the musical scale, and they are best described as tone correctors. Another expression, often applied to a device which modifies the frequency response, is "tone control," but it would seem more appropriate to reserve this for those that change the form of the characteristic of the amplifier and which afford a control to the degree of compensation so effected.

Perhaps the best examples of this are the Multitone tone control transformers, for by the rotation of the knob of a potentiometer the amplifier's characteristic can be varied continuously from a good bass response without treble, to a good high note response without bass, whilst an intermediate position gives a sensibly straight line curve. One of these models interposed between the pick-up and the set will afford all the tone control usually obtained by other means, but without making a single alteration to the set. The Toco model 1:4 ratio is best suited for this purpose. Tone control and the suppression of record surface noises is provided, also, by the Harlie Tone Selector and Scratch Filter, a very neat and compact unit.

Multitone tone control transformer.



The Gambrell Novotone needs no introduction, for it has been in existence now for a number of years. That it should have successfully withstood the test of time with little more than quite minor changes, and these, moreover, only to keep pace with the improvement in recording and in pick-ups, is indicative of the soundness of its design. Briefly, its function is to compensate for the deficiencies in recording and in the whole of the apparatus used for reproduction. By an arrangement of special transformers it gives greatly increased amplification at both ends of the frequency scale and at parts where normally the response would be below the mean level.



Varley compensating R.C.C. unit which has a rising characteristic.

Control of the upper register's amplification can be effected by fitting a 50-ohm variable resistance across two of the input terminals, while, if desired, the amplitude of the bass can be modified by fitting a condenser and a resistance across the output terminals.

Detector Interaction

Causes and Elimination of Certain Whistles in Superheterodynes

By G. J. REDFERN

ARTICLES have recently appeared in *The Wireless World* on the cause and origin of certain squeals and howls peculiar to the superheterodyne principle of reception, such as "second-channel" interference and subharmonic interference, etc., but, so far as the writer is aware, no mention has yet been made or suggestion offered as to the origin of undesirable responses occurring in the form of loud whistles when a superheterodyne receiver is tuned to frequencies equivalent to twice or higher multiples of the frequency of the intermediate-frequency stage. These whistles are noticed to be particularly bad on the long-wave band and would occur at approximately 220 kc/s when an I.F. of 110 kc/s is used, or at 250 kc/s on the tuning dial when 125 kc/s I.F. is used.

A Whistle for Each Harmonic

Further whistles occur (in the case of the 110 kc/s intermediate frequency) at the following dial settings:—220, 550, 660, 770, 880, 990, 1,100, 1,210, 1,320, and 1,430 kc/s, which represent up to the 13th harmonic of the intermediate frequency.

It may be noticed that whistles do not occur unconditionally on all these settings unless stations radiating their carriers are within up to 5 or 6 kc/s in frequency *either side* of the above I.F. harmonics. Even then they will be present only in very sensitive receivers used under conditions giving a large signal input.

The writer carried out a number of experiments in the laboratory with a view to removing these troubles, and, happily, met with considerable success in being able to eliminate entirely all these whistles; at the same time the general noise level was also appreciably cut down.

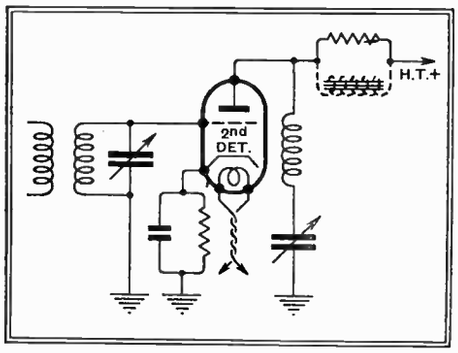


Fig. 1.—A tuned acceptor circuit connected in the anode circuit of a second detector.

It was proved that the sole cause of these whistles was a peculiar form of coupling and regeneration between the first and second detectors. This, at first sight, seems almost impossible, since the first detector is operating principally at high frequencies, while the second detector works principally at intermediate and audio frequencies. It must be remembered, however, that the second detector, owing to its characteristics being non-linear, is capable of producing many harmonics of the intermediate frequency. Coupling can then take place between the H.F. circuits carrying the signal and any harmonic produced in the second detector. Obviously, then, an audio beat note will be produced between the oscillatory currents present in the second detector and H.F. circuits. The beat note heard will vary with the setting of the tuning dial, just as if the set were oscillating.

It was found that by offering a very low impedance path, which consisted of a suitable coil and small variable condenser in series, connected across the "high" point of the second detector and earth, and tuning the circuit thus formed to the same frequency as one of the harmonics, the heterodyne whistle was entirely eliminated. The acceptor circuit thus formed absorbed all the unwanted currents. This is shown in Fig. 1.

The interposition of a high-impedance H.F. choke between the "high" side of the second detector and the following audio coupling greatly assists the "harmonic rejector" in its action. This extra choke may with advantage be tuned to the same frequency as the rejector, and will, at the same time, prevent any I.F. currents of twice the I.F. from finding their way into the following audio couplings. Fig. 2 shows this. It may be found convenient to make the capacity of the variable condenser approximately 250 micro-microfarads and the coil of suitable inductance. The capacity of the condenser would then serve a dual purpose.

Screening the Detector Stage

By arranging virtually complete screening between the H.F. stages and the second detector, whistles from the higher I.F. harmonics will be eliminated. The most convenient way to do this would be to assemble *all* the high H.F. potential leads and components associated with the second detector, and the valve itself, in one complete screening compartment. In view of the strength of the second harmonic (220 or 250 kc/s) it will be found essential to include a suitable rejector circuit as mentioned.

Of perhaps greater importance than the whistles is the reduction of background noise which is found. The noise is due largely to coupling between adjacent numerical values of first detector and second detector harmonics, such as the second detector second harmonic and first detector first or third harmonic. Also the fifth or sixth harmonic of the first detector and fourth, fifth, sixth, or seventh harmonic of the second detector, etc. All these various combinations can give rise to a supersonic beat equivalent to the frequency of the I.F. stage and thus are passed along again and modulated by the I.F. carrier to the second detector, giving

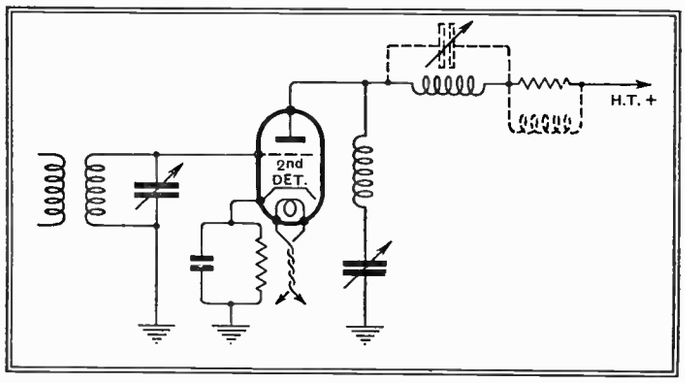


Fig. 2.—The addition of a second tuned circuit to the simple "harmonic rejector" shown in Fig. 1.

rise to hiss and to a noisy background generally.

It is possible that when these precautions are taken that certain limits as to the practicable values of intermediate frequencies will be removed, rendering it easier to choose a suitable value of I.F.

The writer has been able, with a harmonic rejector and an I.F. of 125 kc/s, to tune the radio circuit down as low as 130 kc/s, which is only 5 kc/s removed from the first and strongest harmonic, without any trouble whatsoever.

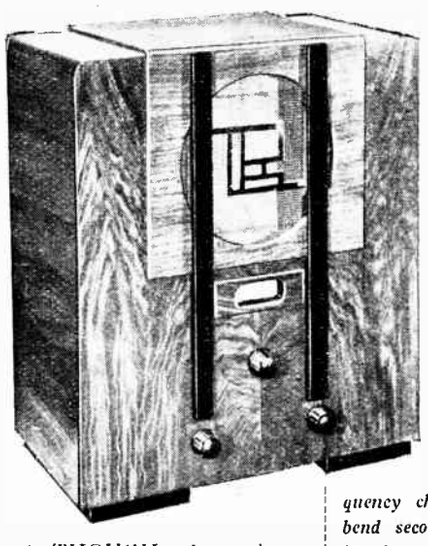
The arrangement as described does not in any way impair the normal sensitivity or selectivity of the receiver, but has the advantage of removing something that is not wanted and, it is hoped, will help to establish the superheterodyne still more firmly as the best all-round receiver.

Valve Data Booklet

IT is regretted that an error occurred in *The Wireless World* Valve Data Booklet with regard to the calculation of the power rating of bias resistances. The last sentence of the third paragraph of the section headed "Output Pentodes" on page 4 should read: "The watts rating of the resistances can be found by multiplying the resistance by the square of the sum of the anode and screen currents and dividing the result by 1,000,000."

Bush Superheterodyne TYPE S.A.C.4

A Quality Product at a Moderate Price



FEATURES. ***Type.***—*Table model superhet. for A.C. mains incorporating moving-coil loud speaker.* ***Circuit.***—*Band-pass input filter—H.F. pentode frequency changer—variable-mu H.F. pentode I.F. valve—anode bend second detector—power pentode output.* ***Controls.***—*(1) Tuning with illuminated and calibrated dial. (2) Volume and on-off switch. (3) Wave-range. (4) Tone control.* ***Price.***—*13 guineas.* ***Makers.***—*Bush Radio Ltd., Woodger Road, Shepherd's Bush, London, W.12.*

ALTHOUGH the price of this set is only 13 guineas, a close examination does not give the impression that price has had any influence on the circuit specification or that cheap labour has been employed in the construction and assembly.

Basically the circuit is the familiar four-valve superheterodyne with a detector-oscillator, single I.F. stage, second detector, and power output valve, but there are numerous detail refinements which contribute to the better performance of the receiver. In the band pass input circuit, for instance, the inductive coupling is automatically adjusted for medium and long waves, and reverse coupling is arranged between the tuned secondary and the aerial coupling coil to neutralise second channel interference.

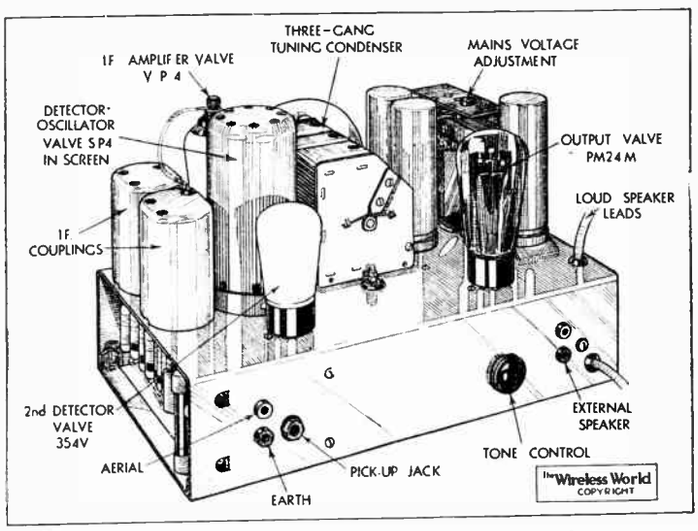
The detector-oscillator valve is of the screen-grid pentode type and is totally enclosed in a separate screening can to eliminate re-radiation and stray couplings. The I.F. valve is a variable-mu H.F. pentode and volume is controlled by varying the grid bias resistance, a portion of which is shunted across the aerial circuit. The second detector is of the anode bend type and the bias is automatically reduced by contacts in association with the pick-up plug and jack. Resistance coupling is used between the detector and pentode output valve and a resistance-capacity filter is included to by-pass stray I.F. currents. A Westinghouse metal rectifier provides the supply to the anode circuits, which are very completely decoupled. The H.T. current is smoothed by the L.S. field which, in conjunction with a hum-bucking coil in the loud speaker unit, gives a negligible hum level.

From the point of view of neat design and clean workmanship the chassis is one of the best we have so far examined. The band-pass and oscillator coils are mounted underneath the chassis on a transverse partition which also carries the wave-range switch. The latter consists of a silver-steel rod carried in substantial brass bushes and has flats milled at intervals which act as cams for the spring switch blades. The design is simple but effective and should give reliable service throughout the life of the set. Space does not permit a detailed enumeration of the little details which indicated the conscientious nature of the construction, but it is safe to say that such quality of material and workmanship is seldom found in receivers of comparable price.

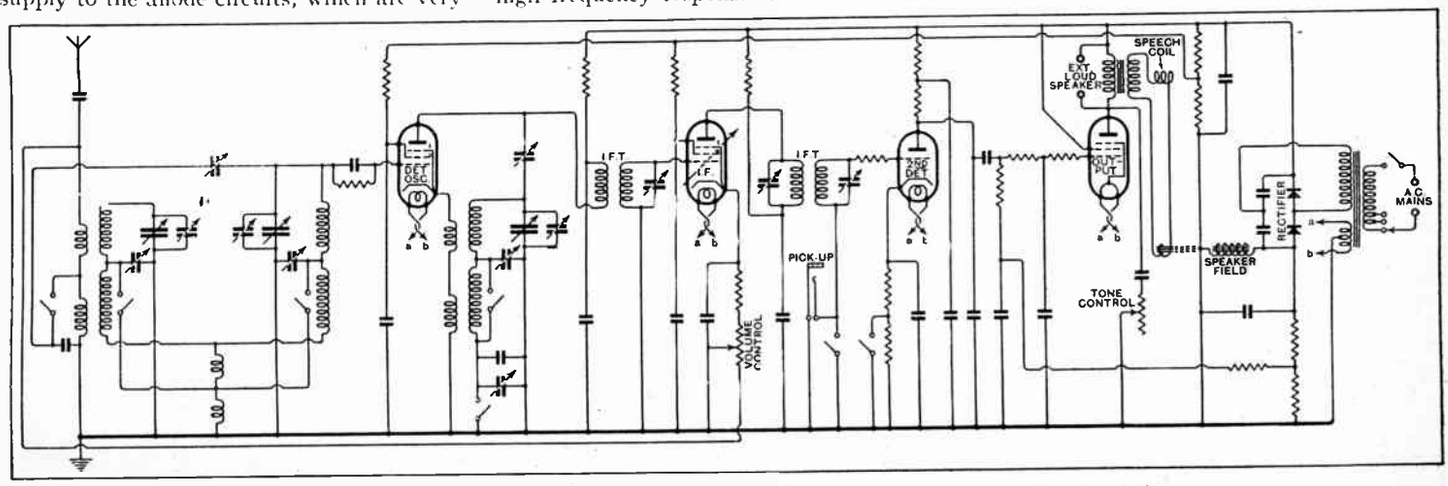
The moving-coil loud speaker is one of the new manufacturer's type B.T.H. units and combines a very widely distributed bass response with good transient attack. The high frequency response is such that background hiss is rather noticeable at times. The well-graded tone control, however, enables a satisfactory reduction in background noise to be effected without serious detriment to the quality. While the tonal balance is excellent, there is a slight tendency to harmonic distortion at low and high volume levels, but at an average level suitable for the normal living room no criticism is possible on this score.

The range is sufficient to give all worthwhile programmes and is as much as can reasonably be expected with stability from four stages. The selectivity, on the other hand, was unexpectedly good, and but for side-band splash, adjacent channel separation would have been possible on both Brookmans Park transmitters in Central London. The performance on long waves is in keeping with that on medium waves and sets a very high standard for a four-valve receiver.

The cabinet conforms to modern standards of design, and is solidly constructed and well finished—and by that we do not mean superficial polish, but conscientious workmanship in out-of-the-way corners, which is characteristic of the set as a whole.



The workmanship and finish of the chassis are of an unusually high standard.



Complete circuit diagram. The input filter is designed to suppress second channel whistles.

Letters to the Editor:—

Stereophonic Broadcasting

Plea for Experimental Transmissions : Duplicating Equipment

The Editor does not hold himself responsible for the opinions of his correspondents

Double Channel Broadcasting

From Professor H. Hartridge, F.R.S.

I ENTIRELY agree with the opinions expressed in recent letters to your journal that the "twin microphone" method necessitates the use of headphones, the use of loud speakers being difficult or impossible. There is, fortunately, another method of double channel transmission which may be called the "twin studio" method, and this, in contradistinction to the twin microphone method, necessitates the use of loud speakers, the use of headphones being difficult or impossible. So far as I know, this method has not been previously described. Its essential requirements are two sound-proof studios, each of which contains a microphone. One microphone is connected to one transmitter, the other to the second transmitter. The listener uses two receivers, each of which is connected to its loud speaker. Now the National Physical Laboratory have shown recently that two sheets of plate glass separated by an air gap of suitable thickness forms a partition which is almost completely sound-proof. Such a partition is used to separate the two studios. Suppose a discussion to be taking place between two people; one speaker is placed in one studio, the other in the other. They are visible to one another but cannot hear one another until they have put on headphones. Thus, when A speaks, B hears him through the headphones, which are connected to A's microphone, and vice versa. Each speaker is separately broadcast and received by the listener, who hears A speaking out of one loud speaker and B out of the other.

Complicated Examples

In the case of a vocalist or any single instrument accompanied by a piano or orchestra, the solo part is performed in one studio and the accompaniment in the other. The listener hears one of his loud speakers reproducing the solo part, and the other reproducing the accompaniment. A small point of detail arises here: the soloist is caused to hear the accompaniment *via* his headphones. Similarly, the accompanying pianist or orchestra is caused to hear the soloist through headphones. But it is clear that each performer must also be able to hear his own instrument (for otherwise he might, for example, play out of tune), and this could be arranged by leakage past the headphones. A felt pad of suitable thickness between the headphone and the ear should enable the necessary leakage of sound to take place. Since the performers both hear and see one another they should be able to keep in time. So far as can be foreseen they can fail only in one way, namely, by not keeping in correct relative intensities. Thus, either soloist or accompaniment may be too loud in respect to the other. These relative intensities may be corrected by the announcer who is in charge of the broadcast, or some other equivalent person. He is provided with two loud speakers each fed by one channel, just as if he were an ordinary listener; by means of a differential volume control he keeps the relative intensities of the performers at a suitable value.

When a band or orchestra is being broadcast many arrangements are possible; thus, in the case of a band the wind instruments could be played in one studio, and the drums and triangle in the other. With an orchestra, the string instruments could be in one studio and the wind instruments in the other. With either of these plans a more elaborate arrangement could be used by the listener if he wished to employ it. Instead of using two loud speakers, each of which covers the whole musical scale, four loud speakers might be employed, two treble prominent (e.g., electrostatic) and two bass prominent (e.g., large moving-coil). One treble loud speaker and one bass loud speaker is connected to one set, the other pair to the other. The listener might arrange these loud speakers as follows: Treble strings reproduced by the loud speaker on the extreme right, bass strings by loud speaker on middle right, bass winds and drums by loud speaker on middle left, and treble winds and triangle by loud speaker on extreme left. By altering the positions of the loud speakers other arrangements could be tried. The B.B.C. might from week to week publish in *The Listener* the actual arrangement of the orchestras and bands which are to be broadcast, so that listeners might imitate the positions of the different parts of the orchestra or bands as closely as their facilities would allow.

Glass Partitions

One more point in connection with bands or orchestra: it would be possible for the conductor to be in one studio and to be seen through the glass partition by the performers in the other studios. But a better arrangement would be to place the conductor in a small room (or passage) separating the two studios so as to be visible to the performers in both through sound-proof double glass partitions. He would be enabled to hear the sound produced in the two studios by means of loud speakers which are arranged exactly like those used by listeners. In this way he would be able to control the different players so as to obtain the best results for listeners. It would probably be quite unnecessary for the performers to use headphones in order to hear what the other half of their band or orchestra are doing.

In conclusion, I would like to emphasise the value of experimental double channel transmissions and to express a hope that they will begin soon. H. HARTRIDGE.

London.

Necessity for Duplicating Equipment

YOUR correspondents on the above subject raise a question as to whether binaural transmission and reproduction can be effective when loud speakers are used in place of headphones.

My own opinion is that the directional effect cannot be perfectly obtained by means of two loud speakers operating in a reverberant reproducing room such as that ordinarily used, but, on the other hand, the use of two such channels instead of one may quite possibly produce a great improvement in the general character of the result.

Everybody, for example, who has listened to piano reproduction is acquainted with the peculiar quality occasionally obtained on certain individual notes. In a large number of cases this has proved to be due to acoustic interference in the transmitting studio, as a slight movement of the microphone will transfer the trouble from one note to another.

The fact that no such effect is obtained by a listener in the studio indicates very strongly that if two microphones were located in the studio and *separately* extended through *separate* channels to the two ears of the listener, no trouble would be experienced. The presumption in this case is that the interference effects on the listener's two ears average each other out.

It is an open question, and one which can only be settled by experiment whether such an averaging process would be obtainable if the two channels terminated in two loud speakers contained in a single reverberant room. Certainly there would no longer be a state of affairs, such as that obtaining at present, where the suppression of a single frequency by acoustical interference at the particular point occupied by the transmitting microphone necessarily results in the suppression of this frequency in any reproducing room whatever.

The use of two telephones and two transmission channels is admittedly the only way in which real acoustic fidelity can be achieved, but, granted that we give up the attempt at scientific reconstruction of the original sound, there seems to be every prospect of obtaining a better result with two channels and two loud speakers than with present-day apparatus, and there is no reason, apriori, why such a result should not be as satisfying as the performance itself, though necessarily different from it.

London, W.C.2. P. W. WILLANS.

Correspondence, which should be as brief as possible, should be addressed to the Editor, "The Wireless World," Dorset House, Stamford Street, S.E.1, and must be accompanied by the writer's name and address

The Radio Industry

THE firm of Ward & Goldstone, Ltd., has just secured contracts for the supply of their air-spaced screened down-lead cable from both the Home and Dominion Governments. It is understood that this low-capacity cable is being successfully employed for short-wave transmission and reception.

"Practical Hints on the Patenting and Development of Inventions" is the self-explanatory title of a useful and well-written 32-page booklet just received from the Imperial Patent Service, First Avenue House, High Holborn, London, W.C.1.

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Extract from "Wireless World."

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Whiteley Electrical Radio Co. Ltd., Dept. W, Radio Works, Mansfield, Notts.

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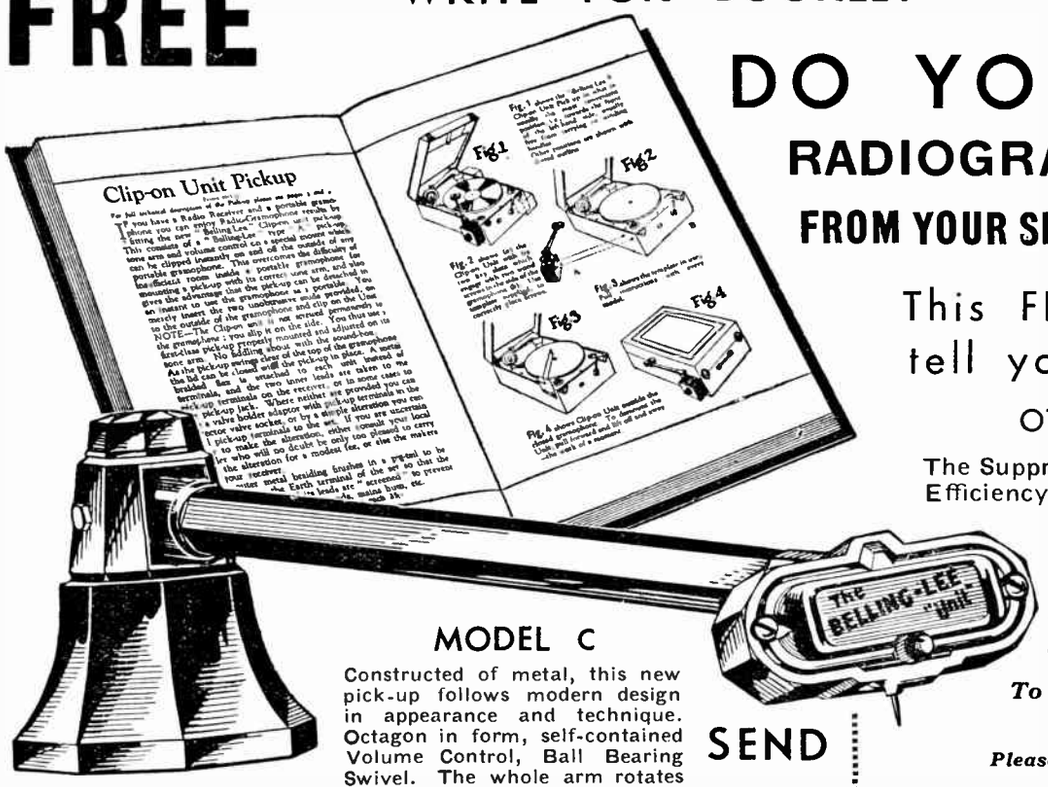

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VORTEXION, Wimbledon, for 99.9% reliable transformers.

IF You Haven't Tried Them Yet Ask Someone Who Has, or call and inspect complimentary letters.

GUARANTEED 12 Months, and within 5% normal and 2½% super models, neat shrouding, with detachable feet, as used by Government Departments, etc., etc.

VORTEXION.—New Monodial transformer, 200-250, 50 cycles, 425-0-425, 120 m.a., 4v. C.T. 3a., 4v. C.T. 1a., 4v. C.T. 1a., 4v. C.T. 6a., screen primary, open type, 20/-; shrouded, 22/-; super shrouded, 26/-; weight 14lb., carriage 2/- extra; 10 henry choke, 5/6, post 9d.; 20 henry, 8/6.

VORTEXION.—5-watt Monodial A.V.C. model, 400-0-400, 120 m.a., 4v. 6a., 4v. 3½a., 4v. 2a., 4v. 1a., super screened, 20/-; shrouded, 24/-.

ALL Secondaries Centre Tapped.

VORTEXION.—250-0-250 60 m.a., 4v. 1 to 2a., 4v. 2 to 4a., open type, 10/6; shrouded, 12/6; post 9d.

VORTEXION D.C.4 Choke, specified for D.C. superhet; 8/6.

VORTEXION Transformers, tested with 2,000 volts between windings.

VORTEXION.—Ferrocart III, 350-0-350, 60 m.a., 4v. 2.5, C.T., 4v. 3.5, C.T.; open type 13/6, shrouded 16/-; post 9d.

VORTEXION.—Super model for H.T.8 or 9 or 10, 4v. 1 to 2, 4v. 2 to 4; open type 14/6, shrouded 16/6; post 1/-.

VORTEXION.—350-0-350, 120 m.a., 4v. 2 to 5a., 4v. 2 to 4a., 4v. 2.5a.; open type 14/6, shrouded 16/6.

VORTEXION.—400 or 450 or 500v., 120 m.a., 4v. 2 to 5, 4v. 2 to 5, 4v. 2 to 5; open type 19/-, shrouded 23/-.

VORTEXION.—400 or 450 or 500, 150 m.a., 4v. 4a., 4v. 2.5, 4v. 2, 4v. 2, 4v. 2, core size 2½×1¼in., a superb job, 2% regulation, 35/-; shrouded with terminals, less terminals, 30/-, open type 26/-; post 1/3.

VORTEXION Auto Transformers to B.E.S.A. Specification, 100, 110, or 120v. to 200, 220 or 240 volts, 60 watts, 9/-, post 9d.; 120 watts, shrouded 12/6, open type 10/6, post 1/-; 200 watts, open 14/6, shrouded 16/6, post 1/-; 2,000 watts, £4/10.

VORTEXION 600-watt Transformers; £4/10, carriage free.

VORTEXION 30h. at 60 m.a. Chokes, 5/6; 40h. at 60 m.a., 8/6; 30h. at 150 m.a., 200 ohms, 10/6 open type, 12/6 shrouded.

VORTEXION Transformers Made to Your Specification; price according to wattage, 6v. filaments same price unless wattage grossly exceeded; special quotations by return.

VORTEXION (S. A. BROWN), 182, The Broadway, Wimbledon, S.W.19. Tel.: Liberty 2814. [3820

TANTALUM for A.C. Chargers, H.T. and L.T. Blackwell's Metallurgical Works, Ltd., Garston, Liverpool. [3448

Mains Equipment.—Contd.

N.P. Have the Following: A.C. Battery Chargers at bargain prices.

N.P.—Special Westinghouse, rectified, 24 volts 2 amps, ammeter, variable resistance; new £8, bargain 85 -.

N.P.—As above, H.T. 200v, 125 m.a., and L.T. 15v. 2 amps.; new £12, bargain, guaranteed, £8.

N.P.—As above, 25v. 3 amps.; this is new and unused; cost £12, exceptional offer, £8/15.

N.P. Have a Tungar, 75v. 6 amps.; cost £22/10, good as new, £12/10.

N.P.—As above, 7.5 to 15v. 5 to 3 amps.; cost £6/10, bargain 70/-.

N.P. Send Trade List and Photographs of Chargers, from 65/- to £17; please state the model in which you are interested.—Nash Products, Ltd., Dept. WW, Stechford, Birmingham. [4007

HOYNE'S Transformers and Chokes the Best Obtainable, perfect insulation, regulation and reliability.

HOYNE'S Transformers, used by many well known set manufacturers after testing all others

HOYNE'S Transformers, fitted with tapped and screened primaries, filaments all centre tapped, stout cast aluminium clamps and clearly marked terminal strips are fitted to all models.

HOYNE'S Components are Guaranteed for One Year; built to your own specification at very competitive prices.

HOYNE'S Components.—The components you will eventually use, start right; a dud cannot pass the Hoyne test.

HOYNE'S A.V.C. Three, 275-0-275v. 60 70 m.a., 4v. 2.5a. 4v. 4a., 12/6, post 1/-; choke, 30 henry 50 m.a., 7/6, post 6d.

HOYNE'S New Monodial Transformer 125-0-125v. 120 m.a., 4v. 3a., 4v. 1a., 4v. 1a., 4v. 6a., 24/-, post 1/3; weight 10lb.; 10 henry choke, 6/-, post 6d.; 20 henry choke, 7/6, post 6d.

HOYNE'S.—250-0-250v. 60 m.a., 4v. 1·2a., 4v. 2·4a., 10/-, post 9d.; with extra 4v. 1·2a. winding, 12/6, post 1/-.

HOYNE'S Ferrocart Model.—350-0-350v. 60 70 m.a., 4v. 2·3a., 4v. 2·4a., 12/6, post 1/-; with extra 4v. 1·2a. winding, 13/6, post 1/-.

HOYNE'S.—350-0-350v. 120 m.a., 4v. 2·3a., 4v. 4·6a., 4v. 1a., 4v. 1a., 16/-, post 1/3.

HOYNE'S.—500-450-0-450-500v. 140 m.a., 4v. 2·4a., 4v. 4·6a., 4v. 2a., 4v. 2a., 27/6, post 1/3; weight 11lb.

HOYNE'S.—0-110-135v. 90 m.a., suitable for H.T. 6 or 7, 7/6, post 9d.; with 4v. 2·4a. winding, 9/6, post 9d.

HOYNE'S.—200v. 200 m.a., 4v. 2·4a., 4v. 1·2a., for H.T. 8; 13/6, post 1/-.

HOYNE'S Chokes, very generous cores, cotton interleaved, fitted with cast aluminium clamps and terminal strips: 30H. 60 m.a., 900 ohms, 6/6, post 9d.; 30H., 120 m.a., 400 ohms, 8/6, post 1/-.

HOYNE'S Line Transformers (auto-wound), tapped 0-100-110-200-220-240v., 60 watt, 8/6, post 9d.; 120 watt, 10/-, post 1/-.

M. J. HOYNE, Offices and Works, 8a, Gladstone Rd., Wimbledon, S.W.19. Tel.: Liberty 3303 [3930

A.C. Battery Charger, 30-volt output, £3 12·6; another 100 output.—Write Jersey, Cumnor Hill, Oxford. [3888

APHE Transformers, shrouded, insulated terminals, tapped primaries, centre tapped heater secondaries, 2 years' guarantee.

APHE 0-135v. 90 m.a., 4v. 2·4a., for H.T.7, 10/6; 0-200v. 180 m.a., 4v. 3·4a., for H.T.8, 13/6; 0-240v. 200 m.a., 4v. 1·2a., 4v. 3·4a., for H.T.9, 14/6; 250-0-250v. 60 m.a., 4v. 1a., 4v. 3·4a., 13/6; 350-0-350v. 120 m.a., 4v. 1·2a., 4v. 3·4a., 4v. 2·3a., 17/6; postage 1/-.—H. H. Bradley, 148, Norwich Rd., Ipswich. [3979

SERADEX Resistors, new illustrated list now ready; immediate delivery from stock of all standard values; specials at short notice.

SERADEX Battery Chargers, type V.R.1326a, will charge up to 400 D.T.G. cells per week; £4 4 complete; full details for stamp.

FULL Range of Catalogues of Seradex Products Obtainable from Makers Trevor Pepper, 575, Moseley Rd., Birmingham, 12. [4028

"EKCO" Eliminator, D.C. (200-250v. mains), in carton, perfect, 25 milliamps; accept 20/-.—Langley, 29, Beresford Avenue, Tolworth, Surbiton. [4021

"DULCI" Unused D.C. Eliminators, 25 milliamps output, 13/ each; post paid, cash with order or c.o.d. Ward, 12, Tredegar Rd., Bow, E.3 [3850

A.C. or D.C. Chargers for 2 to 200 Cells at Low Prices; state requirements; dynamos and rotaries in stock, all sizes; Brown's Generators, battery superseders for H.T. for 2v. or 6v. input, 37/6 and 52/6; television and sewing machine universal motors, 25/-; lists.—Electradix Radios, 218, Upper Thames St., E.C.4. [0398

BATTERY Charging Equipment and H.T. Eliminators. We have for disposal, Standard 1933 models of our battery chargers, new, guaranteed and reliable, outputs of 20 volts (model "J"), 24 volts (Q), 72 volts (S), at 6 amps. for 50% off list price; also Standard 20 m.a. eliminators, Westinghouse rectifier, at 26/6.—Write for illustrated folders to Rectifiers, Ltd., Brierley St., Leicester. [3985

CABINETS.

RADIO-GRAM Cabinets; fully illustrated list free; remarkable values.—Gilbert, Cabinet Maker, Swindon. [1626

MANUFACTURER'S Clearance Lines of Cabinets for Radiograms, loud-speakers, and radio sets; hundreds to select from; send us particulars of your requirements, giving size of set, etc.—H. L. Smith and Co., Ltd., 289, Edgware Rd., London, W.2. [3832

EPTON First Again!—Polished walnut cabinets, with speaker frets, Philco type, undrilled panel (15×12½×7¼), 10/6; Alba (18×14¼×10¼), 14/6; Philomel modernistic cabinets, suitable 3-4-valve set and speaker, enamelled art shade (15¼×15½×9½), 8/9.—Epton, 93, New Rd., Chingford, E.4. [4011

A Word in Your Ear on Moving Coil Speakers

FACT No. 3.

Rola Speakers=

REALISM + RELIABILITY

Rola have been making nothing but Speakers for over ten years. They have built the finest and most modern speaker factory in Europe. Is it surprising, then, that Rola are supplying the great maiority of British Radio manufacturers to-day? The very existence of these firms depends upon the quality of the components which they use. They choose Rola because they know that Rola speakers are far ahead of contemporary practice in design and because they combine realism and reliability in a degree hitherto unattained. See that your set is Rola equipped.

The model illustrated is the Rola F7-PM (9" dial), Price 60/-.

The man who demands Radio at its best and who can appreciate the well-nigh perfect interpretation of every note will find that this Speaker offers him a degree of realism hitherto unknown in Radio Reproduction. For brilliance of tone this outstanding model is definitely in a class by itself.

EXTENSION SPEAKERS

There is a correct Rola Extension Speaker for practically all British Radio Receivers. Rola speakers are used by nearly all British Radio Manufacturers. As it is highly desirable to have the speech coil impedance of the Extension Speaker similar to that of the speaker in the receiver, the necessity for using Rola Extension Speakers is manifest.

THE BRITISH ROLA CO. LTD.,
Minerva Road, PARK ROYAL, N.W.10.
'Phone : Willesden 4322-3-4-5.

ROLA
the World's Finest Reproducers

ROLA SPEAKERS *for better Radio Reception*

DYNAMOS, ETC.

M-L Converter, 12 volts D.C. to 300 volts, 120 m.a. D.C., perfect condition; £4/10.—Whitwell, St. Gabriels, Parklands Drive, Broughton, Preston. [3983

ROTARY Converters, 220 volts D.C. to 200 Volts A.C., capacities up to 0.44 K.V.A., from £4/10.—Milo Engineering Works, Milo Rd., East Dulwich, S.E.22. 'Phone: Sydenham 4422. [3891

LOUD-SPEAKERS.

FERRANTI M.I. list £8/18/6, almost new, with variable matching transformer; £5, or offer. Haskell, Broadview, Causeway, Petersfield. [3986

H.D. Radio Electrical Service Offers Surplus of a Set Manufacturer, every article guaranteed new.

MOVING Coil Speakers, Magnavox type D.C.144, 2,500 ohms or 7,500 ohms complete with transformer at 19/-; type D.C.142, same voltages, at 26/-; all fitted Humbuckers; all goods carriage paid; cash with order or c.o.d.—No. 9, Kingly St., London, W.1. Regent 6240. [3880

30/-!!!—B.T.H. R.K. moving coil speakers, 6in. cone, new and unused, guaranteed; these speakers are the type as used in cinema sound equipment, suitable for public address work; weight 50lb., and vastly superior to the cheap speakers now on the market, 100 volts, 150 volts, and 200 volts D.C

27/6!!!—6-volt D.C. speakers, as above; £2/7/6 speaker as above for 100-250 volts A.C., complete with field rectifier.

B.T.H. Transformer, brand new, ratios 1-1, 2-1, 20-1, and 30-1 microphone; 7/- each.

CARRIAGE Paid, cash with order, or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3771

M.C. Speakers, American Rolas, K type, 2,000 ohms or 6,500, at 18/-, and a few other types, new, perfect; P.M. Midget 5in. cone, multi-ratio transformer, fully guaranteed, 17/6, carriage paid; if in doubt, send stamped addressed envelope; cash with order, or c.o.d.; carriage free.—K.C. Radio Electric, 14, Handel St., W.C. [4022

RADIO AGENCIES Have for Disposal New Moving Coil Speakers, all guaranteed, sealed cartons, approval willingly, all worth three times the advertised prices, real hefty jobs: Magnavox X Core (U.S.A.) Juniors, 7½in. cones, 2,500 or 6,500 ohms, at 18/-; Seniors, same voltages, 8½in. cones, 25/-; state if power or pentode transformer; Rola (U.S.A.) K type Juniors, 7½in. cones, 2,000, 2,500, or 6,500 ohms, at 18/-; Seniors, 9in. cones, same voltages, 25/-; state which transformer; also a number of Juninr and Senior permanent magnets, class B and duals; all goods carriage paid; cash with order or c.o.d.—Radio Agencies, No. 37, Albemarle St., London, W.1. [4020

PICTURE RECEIVER APPARATUS.

TELEVISION Motors, £3/10; scanning discs, £1; particulars, stamp.—Gorman Radio, Lomeshaye, Nelson. [4017

VALVES.

AMERICAN 30 Tubes, experimenter offers 3, as new; 6/- each.—BM ZLME, W.C.1. [4018

8/9.—Ostar Ganz valves, any type; buy a spare set while our stocks last, state type and voltage required; c.o.d., postage paid.—Kay, 167, City Rd., London, E.C.1. [3814

M.R.D. Co.'s Own New British Valves, guaranteed six months; 3/6 to 10/-; complete 2-volt range.—The Mains Radio Development Co., 4-6, Muswell Hill Rd., London, N.6. [4008

EPTON First Again!—This week's bargains: apply early; Lissen H.L.2, 3/6; S.G.215, P.T.2, 6/6; P625a, 6/3; also American, Ostar Ganz, and other non-ring valves.—Epton, 93, New Rd., Chingford, E.4. [4012

ALL Latest Types of Brand New American Valves, first class makes: 247s, 235s, 224s, 236s, 233s, 245s, 244s, 12/-; 227s, 226s, 280s, 245s, 9/6; 242s, 232s, 11/-; U.X.210s, 15/-; U.X.250s, 7 watts output, 16/-; 281s, 14/6; post paid, cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3772

NEWMAN, the Valve Man!—Just arrived, 2,000 brand new latest type American valves, all boxed, guaranteed R.C.A. manufacture; 235 11/-, 224 12/-, 236 13/-, 247 13 6, 237, 13/- 233 15/3, 245 8/-, 244, 14/-, 227 8/-, 226 6/-, 280 8/-, 242 14/-, 232 13 6, 6A7 16/-, etc., etc.; send us your enquiries, prompt attention for cash or c.o.d.—Newmans, 309, Roman Rd., Bow, E.3. [3882

SPECIAL Offer.—Valves by world-famous Continental manufacturers, fully guaranteed, screen grid, variable mu screen grid, high magnification screen grid, low magnification screen grid, H, HL, L, RC; all the above standard mains type, 4/6 each; Philips 328 valves, 5/6; 329 lamps, 2/- the following 4-volt battery valves at 2/- each, H, HL, L, pnwer.—Premier Supply Stores, 20-22, High St., Clapham, S.W.4 Macaulay 188 [3911

COMPONENTS, ETC., FOR SALE.

PREMIER.

PREMIER SUPPLY STORES Offer the following Set Manufacturers Surplus New Goods at a fraction of the Original Cost, all goods guaranteed perfect, carriage paid over 5/-, under 5/- postage 6d extra (Ireland, carriage forward).

ELIMINATOR Kits, including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v. 20 m.a., 20/-; trickle charger 8/- extra; 150v. 30 milliamps, with 4v. 2·4 amps C.T., L.T., 25/-; trickle charger, 6/6 extra; 250v 60 milliamps, with 4v. 3·5 amps. C.T., L.T., 30/-; 200v. 100 milliamps, with 4v. 3·5 amps. C.T., L.T., 49/6; 300v 60 milliamps, with 4v. 3·5 amps. C.T., L.T., 37/6.

T.C.C. Condensers, 750v. working, 2 mf., 3/6; 4 mf. 6/-, 4 mf. 450v. working 4/-, 250v. working 1 mf. 1/3, 2 mf 1/9, 4 mf 2/6, 1,500v working Standoff insulators 0.5 mf. 1/6, 2 mfd, 6/-, aqueous electrolytic 440v working, 4 mf 3/-, 8 mf 5/6

ALL the Following Lines 6d. each or 5/- per dozen; 4- and 5-pin chassis mounting valve holders; shielded screen grid or pentode leads 1-watt wire end resistances, any value; 0.1 condensers; on-off switches push-pull; polar ganging devices; 0.02 condensers, 0.5 condensers, 0.01 condenses, 0.2 condensers.

(This advertisement continued on next page.)

RESPONSE CURVES

In the advertising columns of "The Wireless World," Two Challenges, one direct and the other implied, have appeared from manufacturers of Loud Speakers. We take up these challenges, and in a week or two will publish the Response Curve of the Hartley Turner Loud Speaker in the pages of this journal. Remember, however, that response curves do not tell you everything. Transient reproduction is deeper seated than this: listen to a Hartley Turner and then to some other make. Absence of bass resonances down to 50 cycles can only be achieved by a permissible cone movement of $\frac{3}{8}$ in. with an input of 5 watts. The Hartley Turner is the ONLY speaker with $\frac{1}{2}$ in. freedom of movement. If another WAS made the bass would modulate the treble. Other technical considerations are dealt with at length in "New Notes in Radio," sent for 1½d. stamp.

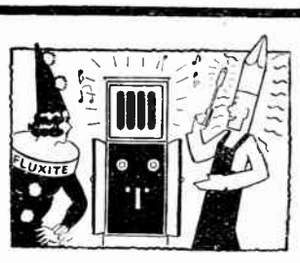
D.C. MODEL - £7 - 7 - 0

A.C. MODEL - £8 - 8 - 0

HARTLEY TURNER RADIO Ltd.,

THORNBURY ROAD,
ISLEWORTH, MIDDLESEX.

Telephone: Hounslow 1854.



We're Fluxite and Solder—the reliable pair! Famous for Soldering—known everywhere!

The Set is now working—just like NEW! Without Fluxite and Solder—What WOULD you do?"

See that Fluxite and Solder are always by you—in the house—garage—workshop—anywhere where simple speedy soldering is needed.

ALL MECHANICS *WILL* HAVE

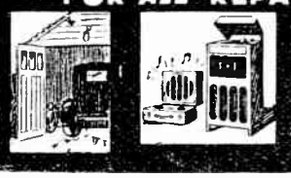
FLUXITE

IT SIMPLIFIES *ALL* SOLDERING

All Ironmongers sell Fluxite in tins: 4d., 8d., 1s. 4d., and 2s. 8d. Ask to see the FLUXITE POCKET SOLDERING SET—complete with full instructions—7s. 6d. Ask also for our leaflet on HARDENING STEEL with Fluxite.

FLUXITE LTD.,
(Dept. W.W.) ROTHERHITHE, S.E.16

FOR *ALL* REPAIRS!



Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)

POLAR 3-gang 0.0005 Condensers, split end vanes, totally screened disc drive; 6/11.

AMSCO Triple-gang 0.0005 Condensers, with trimmers, 4/11.

T.C.C. Electrolytic Condensers, 100 volts working, 15 mfd.; 1/3

PREMIER Chokes, 40 m.a., 25 hys., 4/-; 65 m.a., 30 hys., 6/-; 150 m.a., 30 hys., 10/6.

PYE Chokes, 20 or 32 hys., 4/-; Premier multi-ratio output transformers, giving 15 different ratios, 7/6.

HIGH Inductance Chokes, resistance 2,500 ohms, 60 henrys, 60 m.a; 5/6

WESTINGHOUSE Metal Rectifiers: 120v. at 20 m.a., 6/6; 180v. at 30 m.a., 8/6.

HARLEY Pick-up, complete with arm and volume control; 12/6

BRITISH RADIOPHONE Wire Wound Potentiometers, with mains switch incorporated. 5,000 ohms, 10,000 ohms, 50,000 ohms, 100,000 ohms, any value; 3/6.

KOLSTER BRANDES Gramophone Motors, dual type, can be worked by clockwork or mains, induction type 100-250 volts, 27/6, complete with all fittings and turntable.

MAGNAVOX D.C.144, 2,500 ohms, 17/6; Magnavox D.C.142, 1,000 ohms, 21/-; all complete with Humbucking coils; please state whether power or pentode transformer required; A.C. conversion kit for either type, 10/-.

SPECIAL Offer.—Microphones by prominent manufacturer, high sensitivity, uniform response, complete with stand, transformer and battery; listed £3 15, our price 18/6.

PREMIER British Made Meters, moving iron, flush mounting, accurate; 0-15, 0-50, 0-100, 0-250 milli-amps., 0-1, 0-5 amps., all at 6/-.

ORMOND Condensers, 2-gang, semi shielded, 2/6; wire wound potentiometers, 15,000 ohms, 1/6.

SPECIAL Offer of Mains Transformers, manufactured by Philips, input 100-115v. or 200-250v., output 130-0-130 volts, 40 m.a., 4v. 1a., and 4v. 3a., 4/6; 200-0-200v., 4v. 1a., 4v. 3a., 4/6.

ALL Premier Guaranteed Mains Transformers have engraved terminal strips with terminal connections, input 20-250 volts 40-100 cycles, all windings paper interleaved.

PREMIER H.T.8 Transformers, 250v. 60 m.a., rectified with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 25/-.

PREMIER H.T.9 Transformer, 300v. 60 m.a., rectified with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectified, 26/-.

PREMIER H.T.10 Transformer, 200v. 100 m.a., rectified with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.

DOUBLE Spring Motors, made by Garrard, play five sides of 10in. record, complete with turntable and all fittings; 17/6.

McMICHAEL 2-screen Grid Pentode Transportable 4, complete; gets many stations; £3; no valves or batteries.

SPECIAL Offer.—Accumulator chargers, input 200-250v. A.C. to charge 2- and 4-volt accumulators at ½ amp.; owing to the high efficiency of the silver oxide rectifier employed charger may be used during broadcast; 9/6 each.

CENTRALAB Potentiometers: 50,000, 250,000 and 500,000 ohms, 2/- each; ditto, wire wound, 200 ohms and 400 ohms, 1/-.

A FEW More Only.—Western Electric 4211E's and 4211D's, 15/-; 4212's, £3; callers only.

WESTERN ELECTRIC Mains Transformers: 500-0-500v. 150 m.a., 4v. 3-5 amps., 4v. 2.5 amps., 4v. 2-3 amps., 4v. 1 amp., C.T., 4v. 1 amp., C.T.; 19/6.

RELIABLE Canned Coils with circuit; accurately matched; dual range; 3/- per coil.

PREMIER L.T. Supply Units, consisting of Premier transformer and Westinghouse rectifier, inputs 200-250 A.C. output, 8v. ½ amp., 13/6; 8v. 1 amp., 17/6, 15v. 1 amp., 19/-; 6v. 2 amps., 27/6; 30v. 1a., 37/6.

PREMIER Mains Transformer, output 135v. 80 m.a., for voltage doubling, 8/6; 4v. 3-4a., c.t., L.T., 2/- extra; Westinghouse rectifier for above, giving 130v. 30 m.a., 8/6.

PREMIER Mains Transformers, output 250-0-250 volts 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary, 15/-.

PREMIER Mains Transformers, output 350-0-350 volts, 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary; 15/-.

PREMIER Mains Transformers, output 400-0-400 volts, 100 m.a., 4v. 4-5a., 4v. 2-3a., with screened primary; 15/-.

PREMIER Auto Transformers, 100-110, 200-250 volts or vice versa, 60-watt, 7/9; 100-watt, 10/-.

SPECIAL Offer of Manufacturers' Type Transformers, any input, output 250-0-250 volts, 60 m.a., 4v. 1a., 4v. 3a. (both c.t.), 8/6; H.T.8 transformer, with 4v. 3-4a. (c.t.), 8/6; with rectifier, 18/6.

FILAMENT Transformers, polished and engraved terminal boards, N.P. terminals, 4v. 3-4a., 5/-; 10v. 3a., 6/6; 12v. 1a., 5/-; 4v. 4-6a., 6/6; 14v. 4a., 6/6; 22v. 1a., 6/-; 6v. 2a., 5/-; 9v. 1a., 5/-.

PREMIER Eliminators, input 200-250 volts, 40-100 cycles, A.C., incorporating Westinghouse metal rectifiers, output 250v. 60 m.a., S.G. and 120v. taps, 42/6; with 4v. 4a., c.t. L.T., 7/6 extra.

PREMIER Eliminators, output 150v. at 30 m.a., S.G. and 100v. taps, with 4v. 3-4a. c.t. L.T., 37/6; or with trickle charger, 42/6.

PREMIER Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps, 27/6; with L.T. trickle charger incorporated, 35/-.

(This advertisement continued on next page.)

POWER RESISTORS

FOR UNIVERSAL USE

We offer Radio Constructors a range without equal in quality or price. Every Resistance is *triple tested* for accuracy and performance; since their introduction they have been commended by all the leading technicians, manufacturers and constructors. The non-ferrous nickel-chrome wire is spiralled on heat-resisting core and retains itself on the grooved porcelain former. The tapping bands can be adjusted for non-standard values without disturbance of the windings.

50 to 25,000 ohms, **2/6** each.
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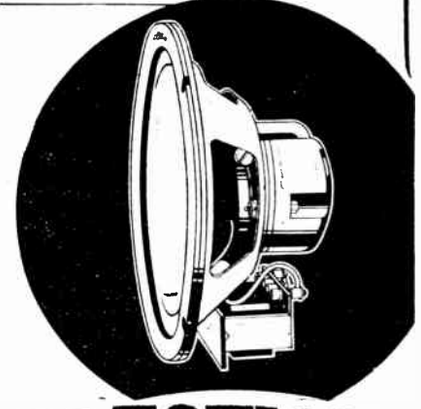

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SPECIAL Offer of Wire Wound Resistances.—4 watts any value up to 10,000 ohms, 1/-; 8 watts, any value up to 15,000 ohms, 1/6; 15 watts, any value up to 1,000 ohms, 2/-; 25 watts, any value up to 50,000 ohms, 2/6; 50 watts, any value up to 50,000 ohms, 3/6.

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PREMIER. [3972

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R. [3993

RELAYS, two-coil 1,000, 1,000 ohms, 7 terminals; 8/-, postage 6d

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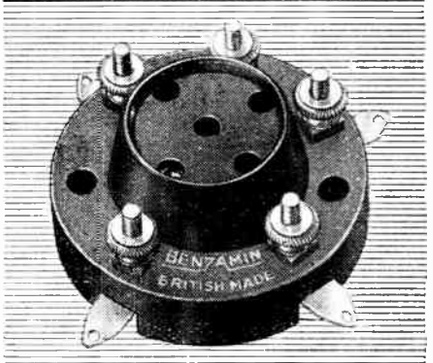

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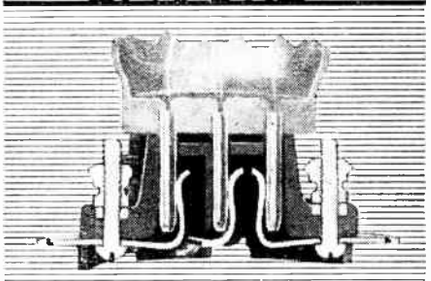

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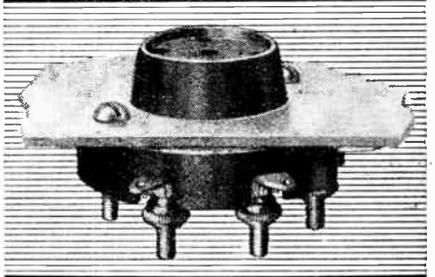

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The Benjamin 5-pin is a perfect masterpiece, bearing witness to the meticulous care and attention given to every little detail in its construction.

Examine the contacts; these are sprung in such a way as to ensure a maximum downward thrust on the valve pins, the main pressure being above the thick portion of the split valve leg, with the result that the valve snaps home in the holder—thus perfect contact is always maintained. The contacts, which are of course self cleaning, are taken through the body of the holder and form the solder tags. This one-piece solder tag and socket is just another Benjamin advantage.

In the lower illustration the terminals have been reversed and the valveholder is seen mounted flush beneath the baseboard. To allow for this flush mounting every terminal hole is countersunk to take the screw head on the terminal.

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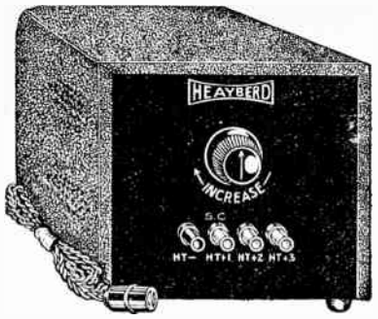
BENJAMIN

The Benjamin Electric Ltd., Tariff Road, Tottenham



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Send for Booklet No. C.1 giving full particulars.

52/6 excluding valve.

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118 Bunhill Row, London, E.C.1
Met. 0314 (6 lines).

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RADIO for Million.—Station Master kits for A.C. mains, 200-250 volts, complete with Mullard valves and mains unit, but less speaker; listed £10/10, £4 10, in sealed boxes.

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SPECIAL Offer of New Hampton 6-valve D.C. Mains Receivers, incorporating Band Pass tuning, 2 variable mu H.F. stages, detector and 2 D.P.T. pentodes, in push pull, fitted with Senior Rola speakers, in walnut cabinets; listed 23 guineas, 1933 catalogue, £9 10 each; one ditto A.C. mains, with 2 A.C. Pens., in push pull, £10.

ALBA Model 55 D.C. Main Set, 3-valve screen grid with pentode output, in walnut cabinets; listed, 1933 catalogue, £17 17, in sealed boxes, with valves, £7 10.

ALL Carriage Paid.

WE Hold Very Large Stocks of A.C., D.C. and battery receivers, and solicit enquiries.

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ALL-MAINS Transformers and Chokes Guaranteed for 12 Months, specials quoted for and delivery given within 3 days of order.

VARIABLE Condensers, Lotus 2 gang 0.0005, complete with dial, knob, escutcheon, 8/6; all ganged condensers are fully screened with trimmers, and boxed; Lotus Dyblock single variable condensers, 0.0005, complete with dial, escutcheon, etc., 4/9 (list 9/6); Hydra block condensers, new, 16 mfd., 2+2+8+2-1+1, 1,000 volt test, 7/- each; 4 mfd., 2/6; 2 mfd., 1/9; 1 mfd., 1/-; T.C.C. 4 mfd. electrolytic, 440 D.C. working, 3/- each; Hellesens 8 mfd. electrolytic, 3/9 each.

SPEAKERS.—Permanent magnet speakers, 7in. cone, 23/- (listed 49/6); D.C. mains energised, 2,500 to 6,500 ohms, complete with humbucking coils and transformers, 16 6 (list 39/6); 7 Magnavox moving coil D.C., 2,500 ohms, 18/- each (list 39/6); G.E.C. Stork speakers, complete in magnificent cabinet 19 6 (listed £3 15); Ormond speakers, complete in cabinets, 10 - (listed 25/-); Blue Spot, 100T, 13/6 (list 37/6).

CONSTRUCTORS' Kits.—Ready Radio Meteor screen grid 3-valve kit, less valves, 26/-; with 3 Mullard valves (P.M.12a, P.M.2D.X., P.M.2a), 49/- (list £5 7 6); Universal Radio 3-valve kits, ready assembled on chassis, 12 6 (listed 45/-).

READY RADIO "303" A Kits, complete with cabinet, M.C. speaker, less valves, £2 5; with 3 Mullard valves (P.M.1L.F., P.M.2D.X., P.M.2), £3 5 (list £6 17 6).

READY RADIO Meteor "A" 3-valve Screen Grid Kit, complete with cabinet, M.C. speaker, less valves, £3/7 6; with 3 Mullard valves (P.M.12A., P.M.2D.X., P.M.2A.), £4 10 (list £8 7 6).

READY RADIO S.T.400 Kits, as specified by Scott Taggart, £2/19/6 each (list £4 17/6); Mullard Radio for Million 3 valve battery kits, complete with 3 Mullard valves, £3/3 (list £6 2/6), all kit new, in original sealed cartons.

B.T.H. Senior Pick-ups, 1934 model, with volume control, 28 - each (list 37 6); Marconi pick-ups, 1934 model No. 19, 25/- (list 32/6); H.M.V. volume controls, 1/6 each (list 12/6); Radiophone volume controls, with switch, 3/- each (list 10/6); Amplion loud-speaker units, 2 3 (list 12/6).

RECEIVERS.—Burgoyne 3-valve battery transportable sets, complete with valves, batteries, accumulator and speaker; £3/2/6 (list £7/19 6); new, in cartons; one only, Higgs Class B 6-valve superhet, battery set, £9/9 (list £18 18), new.

ALL Goods Guaranteed New and Perfect and Sent Carriage paid.

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METERS Moving Coil, Weston 301; 10 m.a. and upwards, 22/6; Galvos 30-0-30, 27/6.

NEW British Made, 1 m.a., 27/6; 250 volts (1,000 w. per volt), 32/6; Turners 20 m.a. upwards, 17 6; thermo ammeters, 1.5a, 22/6; French 3-range, 3 m.a., 6v., 240v., 22 6, 2-range, 2 m.a., 240v., 20 -; German 2 m.a., 25/-; 2,000 volts, 32/6; assorted makers, 25 m.a. and upwards, 10 6; laboratory apparatus in stock; meter repairs a speciality.—The Victa Electrical Co., 47, High St., Battersea, S.W.11. 'Phone: Batt. 0780. [0355

FERRANTI Valve Tester, 300 volt, type V.T.1, in perfect order, cost £7/5 when new; what offers?—Yeo, R.A. Mess, Woolwich. [3987

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Positive METAL to METAL wiring. Firm grip and full contact with ALL sockets with internal diameters from ¼in. to 5.32in. battery socket. Curved ends for easy insertion. Price **1½d.**

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Type B, with Hexagonal Shoulder for easy mounting **4d.**

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Clix interesting New Folder "W" gives details of over 30 Perfect Contact Components. Write for a copy now.

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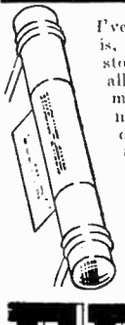
LECTRO LINX LTD., 79a, Rochester Row, S.W.1



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RESISTORS

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ELECTROLYTIC Smoothing Condensers, T.C.C., 0.8 mf., 440v., 3/11; Hellesen, ditto, 3/3; ditto, dry, 8+4 mf., 3/3.

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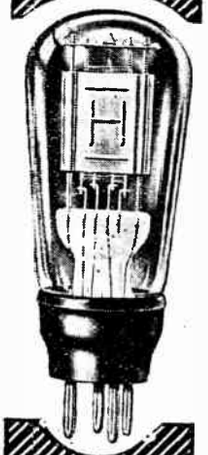

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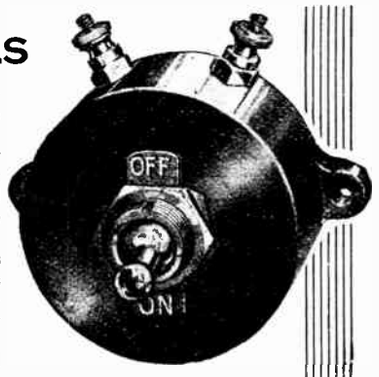

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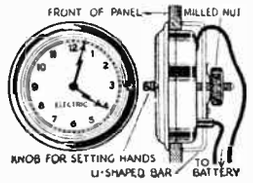

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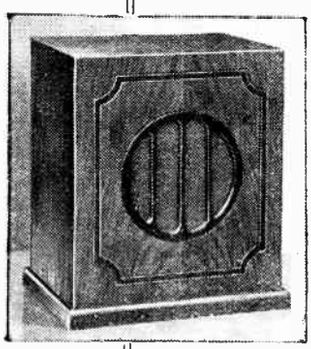

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IN THE PAGE ADVERTISEMENT FOR TRIOTRON VALVES IN "THE WIRELESS WORLD" VALVE DATA BOOKLET DATED NOVEMBER 3rd, 1933, AN UNFORTUNATE ERROR APPEARED.
IN THE SECTION DEALING WITH TRIOTRON INDIRECTLY HEATED D.C. VALVES, THE FILAMENT CURRENT WAS INCORRECTLY STATED. THIS SHOULD HAVE READ AS FOLLOWS :—

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KINDLY MAKE THIS CORRECTION IN YOUR COPY OF THE DATA BOOKLET.

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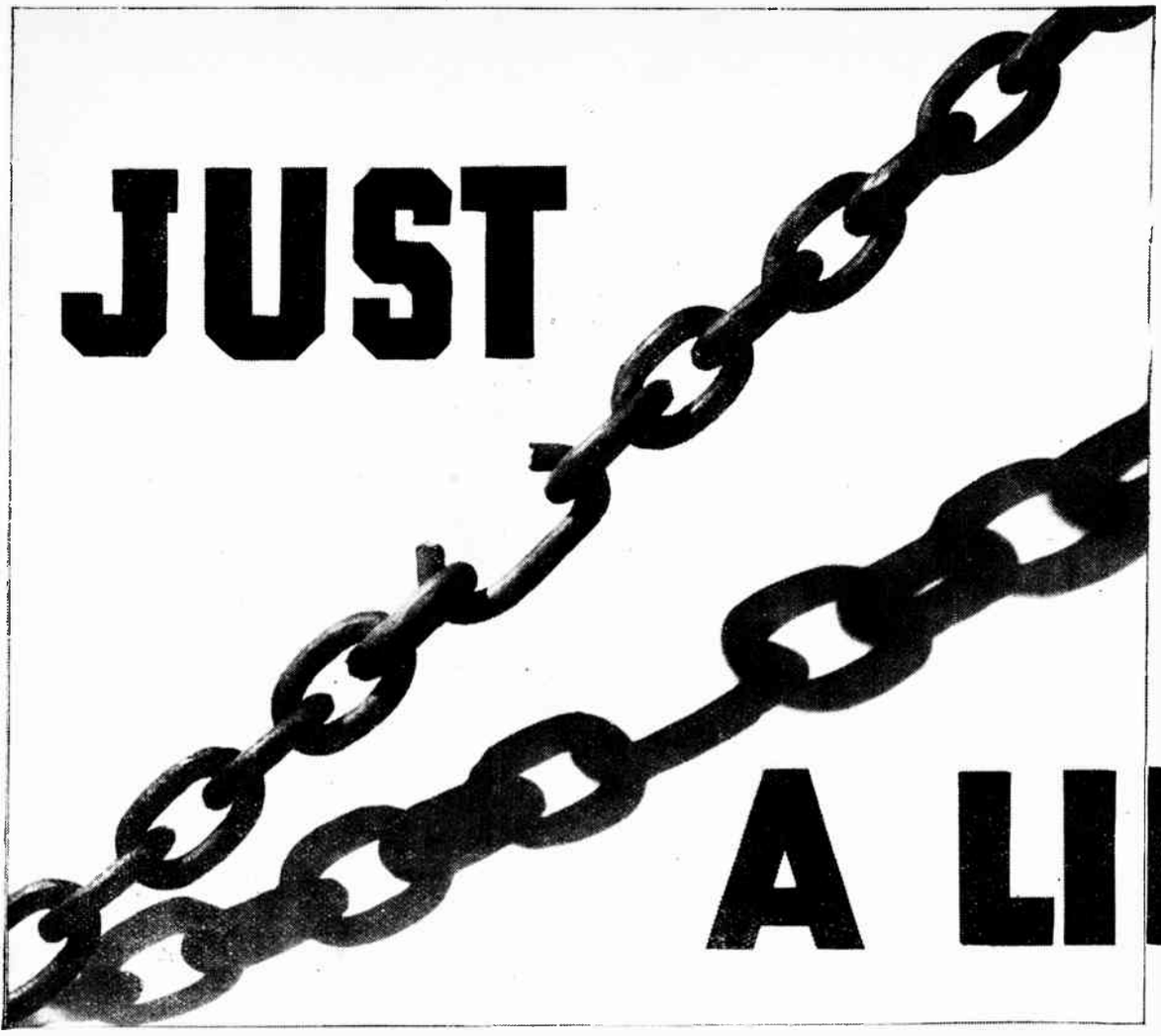

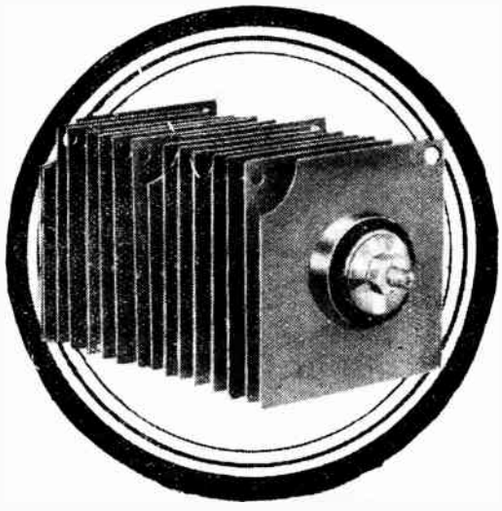

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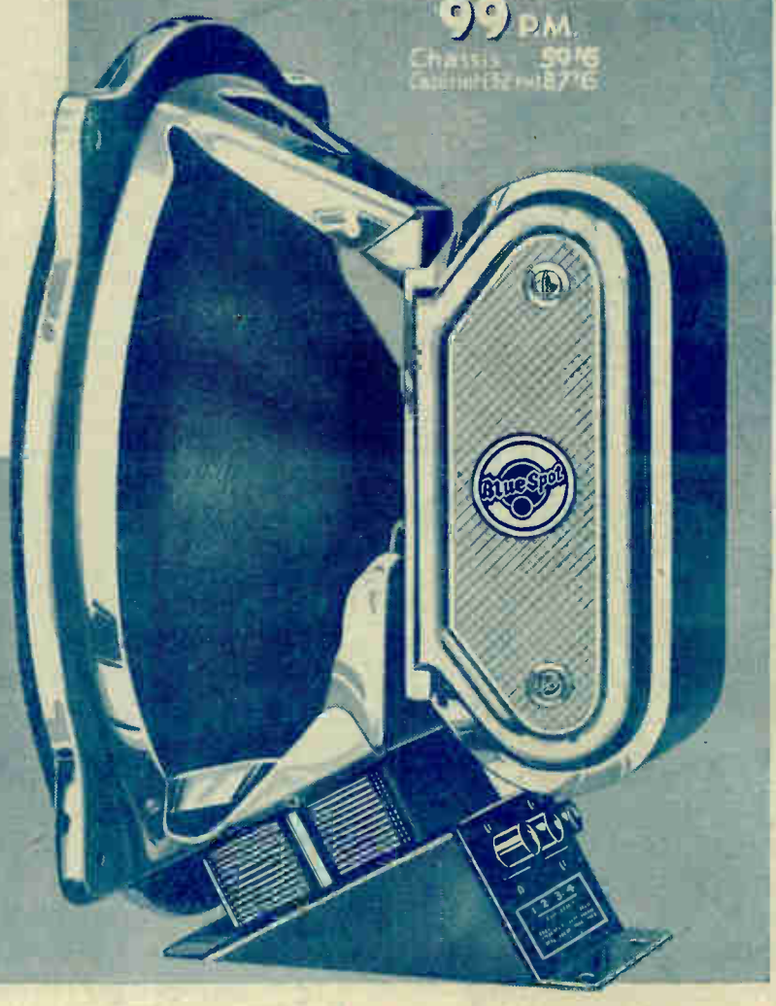

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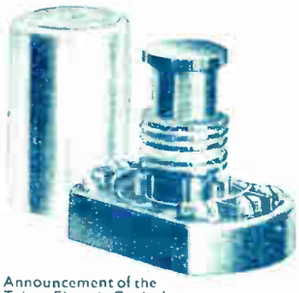

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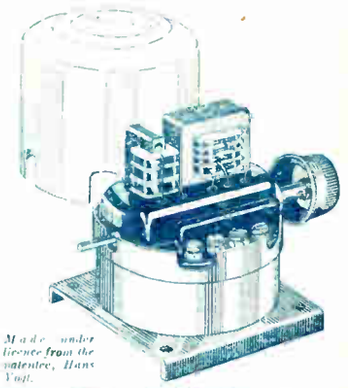

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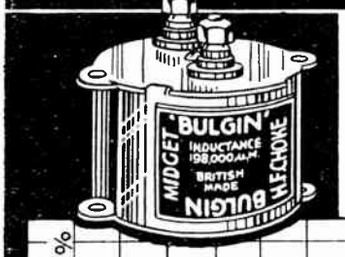

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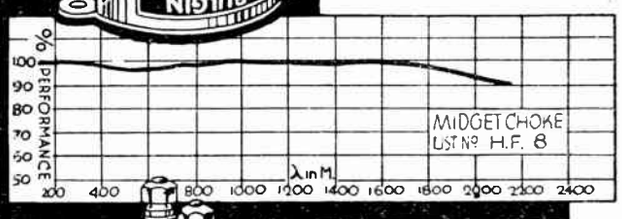

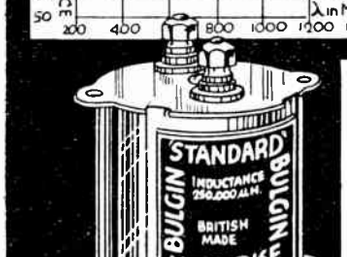

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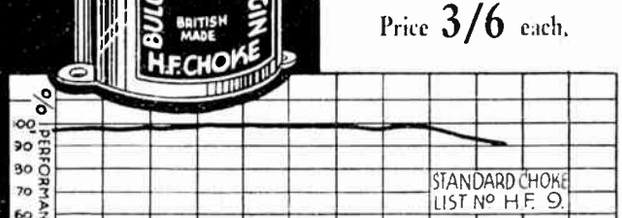

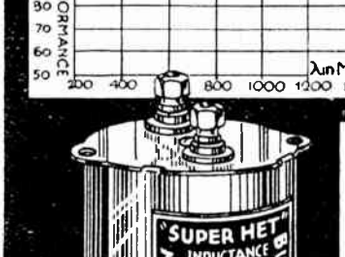

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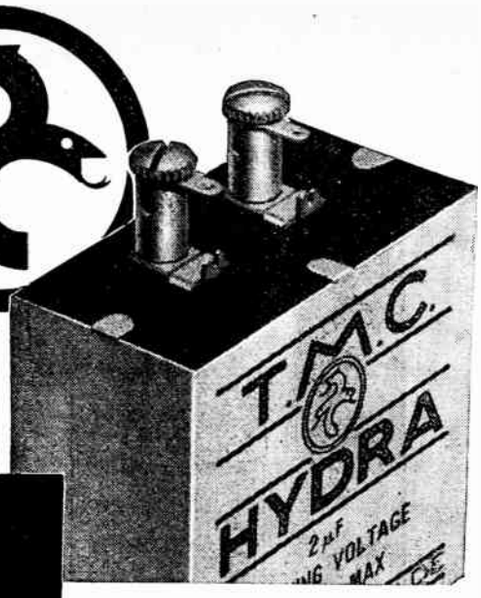

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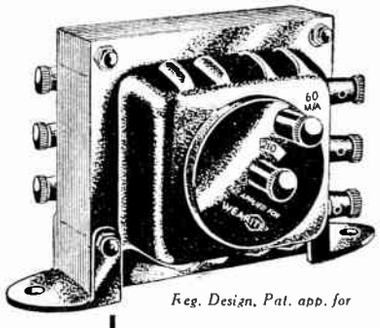

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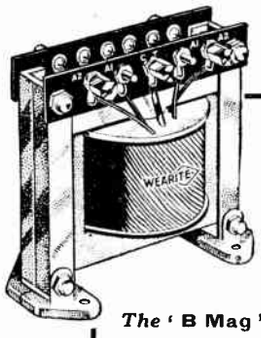

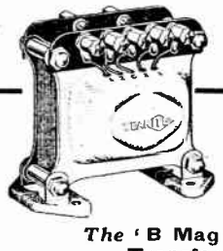

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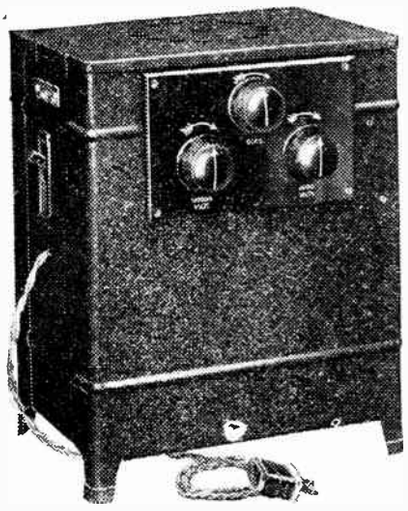

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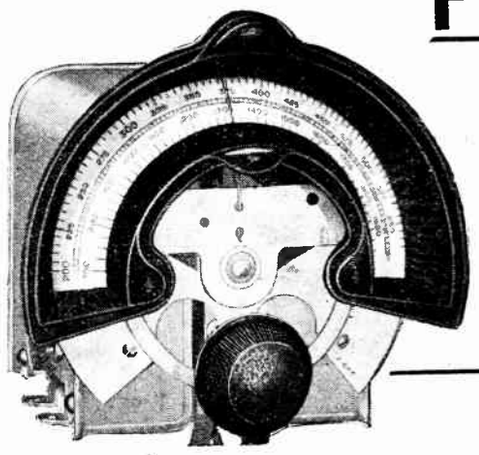

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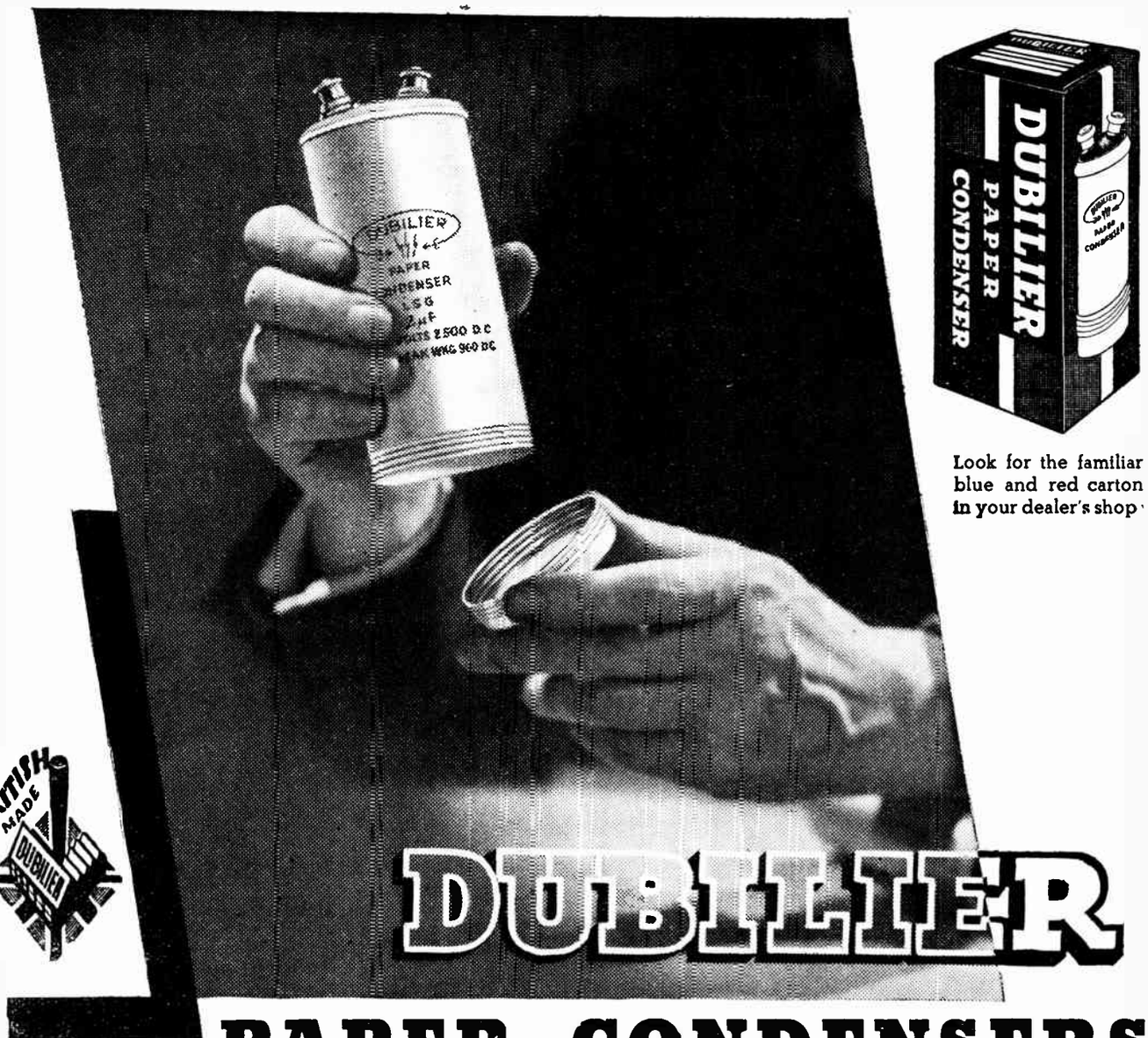

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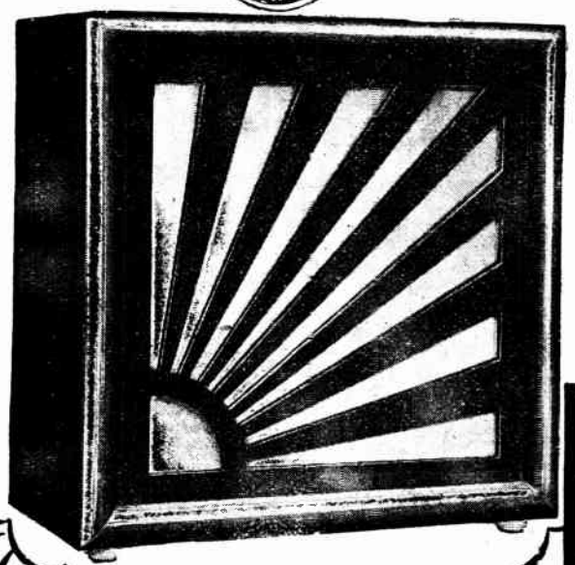

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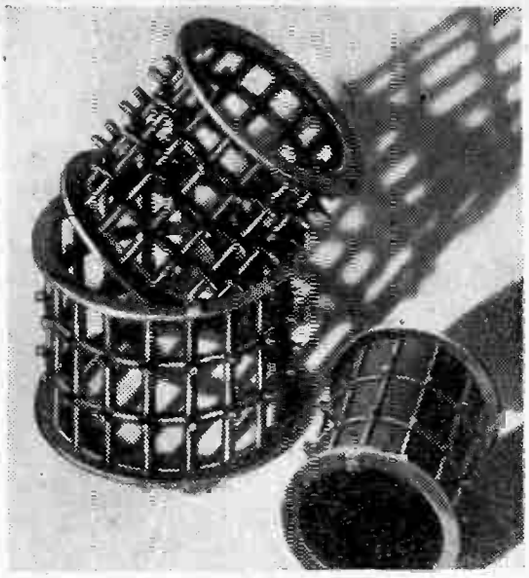
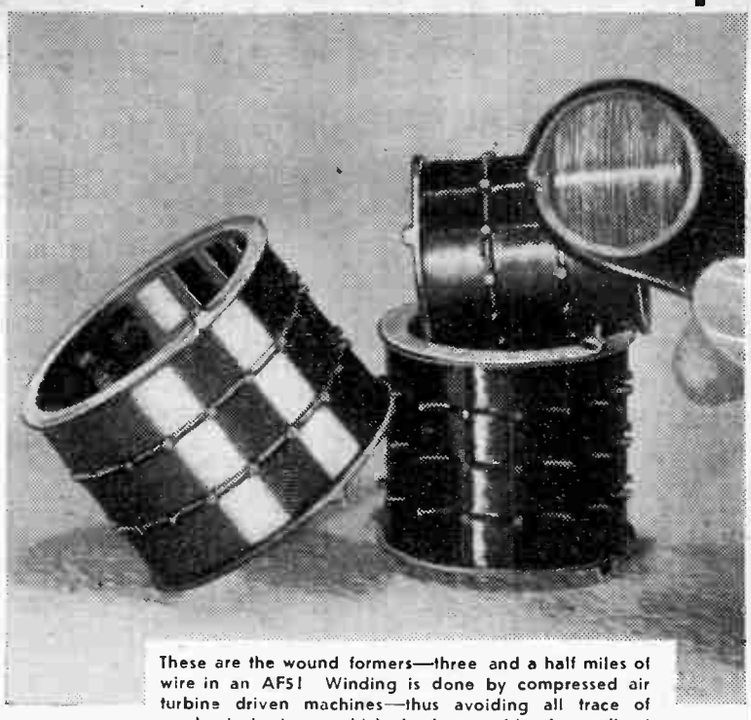


Here are the three special insulating formers with their moulded-in pegs for external connection anchorage. Note the air-spacing for windings, and the absence of paper, cotton, or other hygroscopic material which causes breakdown.



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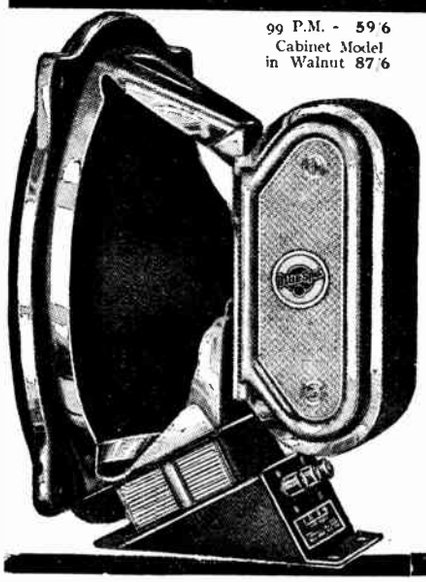

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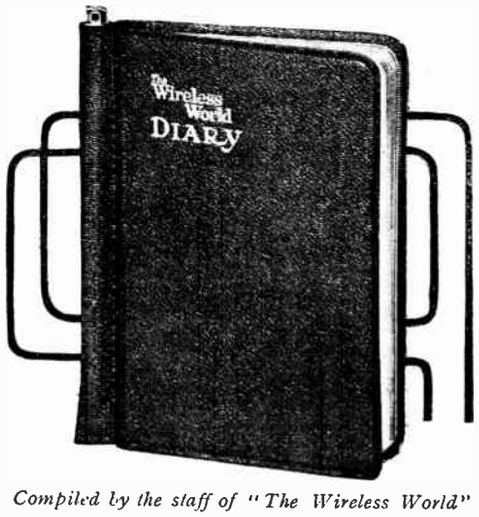

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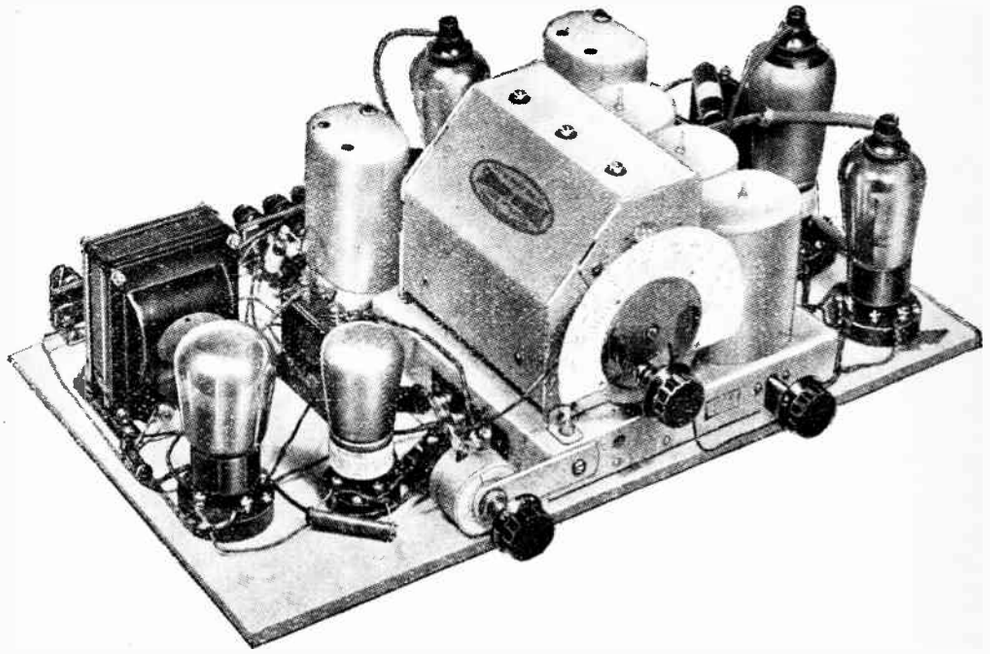

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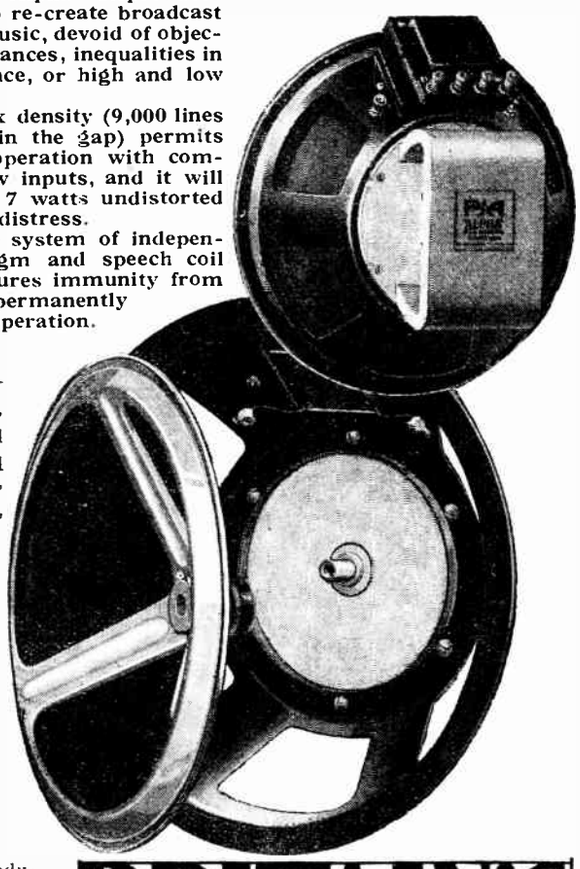

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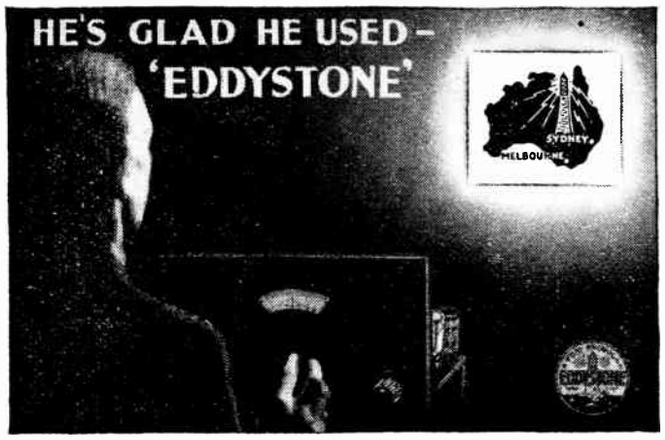

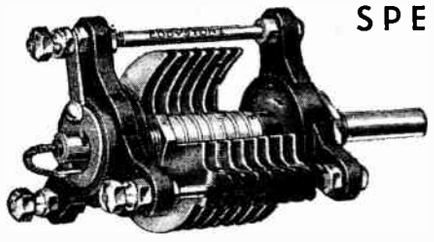

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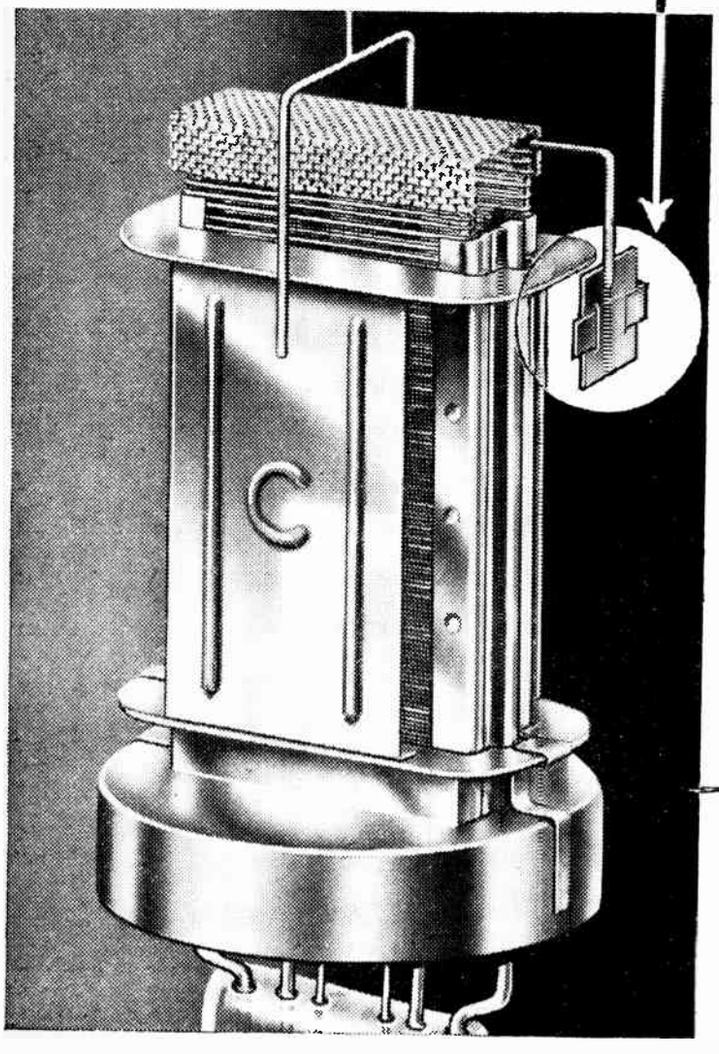

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The Wireless World

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23rd Year of Publication

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As many of the circuits and apparatus described in these pages are covered by patents, readers are advised, before making use of them, to satisfy themselves that they would not be infringing patents.

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EDITORIAL COMMENT

Calibrating the Receiver

A Great Opportunity in January

THE nights of January 14th and 15th next should be of unique interest to readers of *The Wireless World*. As we were able to reveal last week, the International Broadcasting Union has wisely decided that the great transfer of wavelengths under the Lucerne Plan shall be conducted as far as possible in an orderly fashion under the direct supervision of the Union's own checking station at Brussels.

The magnitude of the operation is without parallel in the history of wireless. Whereas, with the inception of the Prague Plan six years ago, there were 173 stations to be accounted for, now there are no fewer than 230—many of higher power—and M. Braillard, the technical secretary of the Union, will add fresh laurels to his already established reputation as "ether policeman" if the plan of operations is successful.

Orderly Progression

The attractiveness of the plan, apart from the probability that it will avoid the comparative chaos which attended the introduction of the Geneva and Prague wavelength schemes, lies in the possibility that every European station may, at the start, at any rate, be working on a known wavelength, guaranteed accurate by the Brussels wavemeter. Listeners will thus have an unprecedented opportunity to calibrate their own receivers. On the actual night of the transfer, beginning at Zero Hour (11 p.m. G.M.T.) certain high power stations, easily receivable in this country, will be transmitting announcements as and when each station is calibrated at the control point. Most British listeners will probably tune-in Radio-Paris, which will be recording the progress of the change-over at the broadcasting stations in Belgium, Spain, France, Great Britain, Ireland, Iceland, Luxembourg, Morocco, Holland, Portugal and Switzerland. It will then be possible to "nail down" these transmitters one by one on the tuning dial of the receiver in reasonable confidence that the wavelengths are actually as stated.

Long-wave Prospects

No doubt some listeners will seek an opportunity to follow the wave changes as they are being made in Central and Eastern Europe, but the purpose of calibration will be served if some twenty or more nearer stations can be accurately observed.

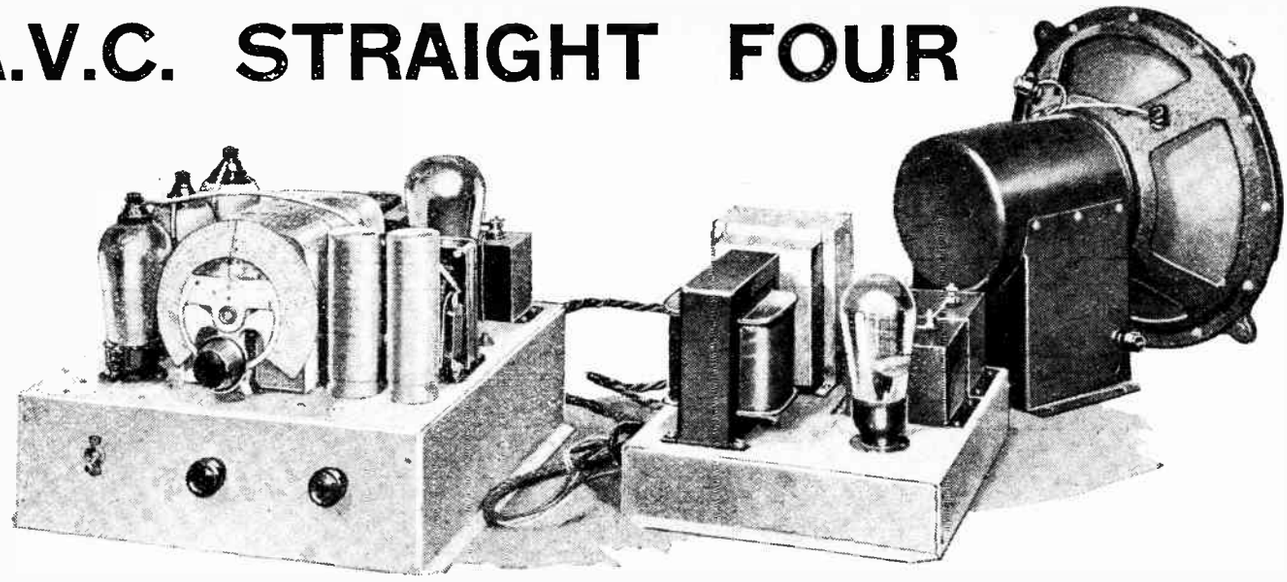
Minor wavelength changes are bound to follow as and when the Lucerne Plan is put to practical test, but the point of essential importance is that every listener who has carefully followed the checking process will have a receiver calibrated throughout the tuning scale. To achieve such an end it will be worth while on January 14th and 15th, misquoting Milton, to "shun delights and live laborious nights."

Unhappily these bright prospects are confined to the medium waveband. Of the twelve countries using long waves, five are non-signatories to the Lucerne Plan, and it is difficult at the moment to see how any arrangement of the long waves can be satisfactory until all long-wave users can be brought to understand that the old roving days are over so far as European broadcasting is concerned.

Perhaps the delinquents will bow to the inevitable, as has just been done by the recalcitrants on the medium waves, by adopting the Lucerne Plan "without any obligation."

The Wireless World

A.V.C. STRAIGHT FOUR



A Highly Selective A.C. Receiver Including Iron-Cored Coils

THE introduction of iron-cored tuning coils has permitted such a great increase in the selectivity of the straight set that it can now approach that of the superheterodyne, and once more take its place as a satisfactory receiver for distant reception. The A.V.C. Straight Four includes four such circuits, and automatic volume control is fitted to reduce the effects of fading.

ALTHOUGH the superheterodyne has largely ousted the straight set where high selectivity and sensitivity are required, this is in great measure due to a trend which set in before the advent of compact high-efficiency tuning coils. This does not mean, of course, that the trend is in a wrong direction, for the characteristics of the superheterodyne are such that its popularity would have been inevitable. Had iron-core coils been developed earlier, however, it is safe to say that the straight set would not have been displaced to such a large degree.

One of the outstanding advantages of the straight set is its freedom from second channel interference, and, in the eyes of many, this is sufficient to compensate for the somewhat lower adjacent channel selectivity as compared with the superheterodyne. Furthermore, the ganging adjustments are simpler.

However efficient a coil may be, it becomes of no avail if it be connected in a circuit incorrectly. The connection of any components to a tuned circuit inevitably lowers its efficiency to some degree, but such additional components are essential if any use is to be made of the circuit. The problem of design, therefore, resolves itself into finding that method of connection which introduces a minimum of loss while still retaining efficiency.

A glance at the circuit diagram of Fig. 1 shows that, in the case of the aerial tuned circuit, the first valve is connected across the whole of the coil, for the input impedance of a screen-grid H.F. amplifier is quite high and it throws little damping on the tuned circuit. The aerial, however, is connected to a tapping on the coil which is so placed that an efficient coupling is obtained with a minimum of damping. In order that the ganging may

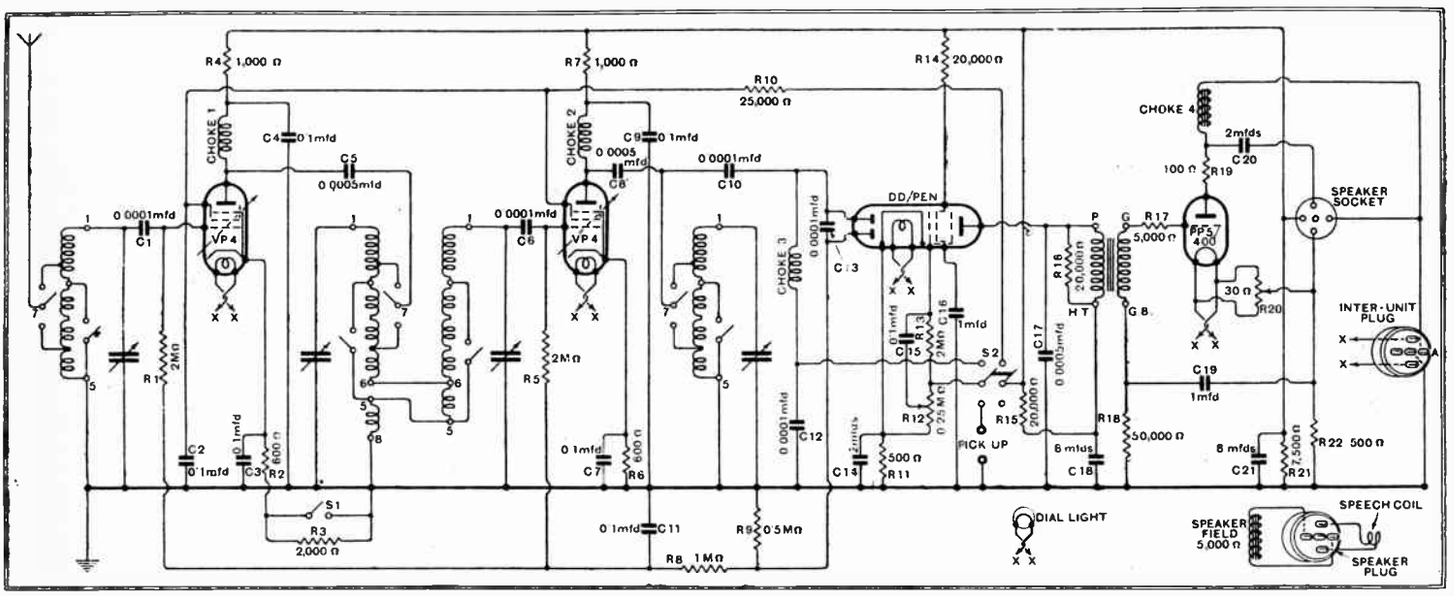


Fig. 1.—The circuit diagram of the receiver unit. It will be noted that the band-pass filter is fitted between the two H.F. stages for which variable-mu H.F. pentodes are employed. The detector is a duo-diode-pentode.

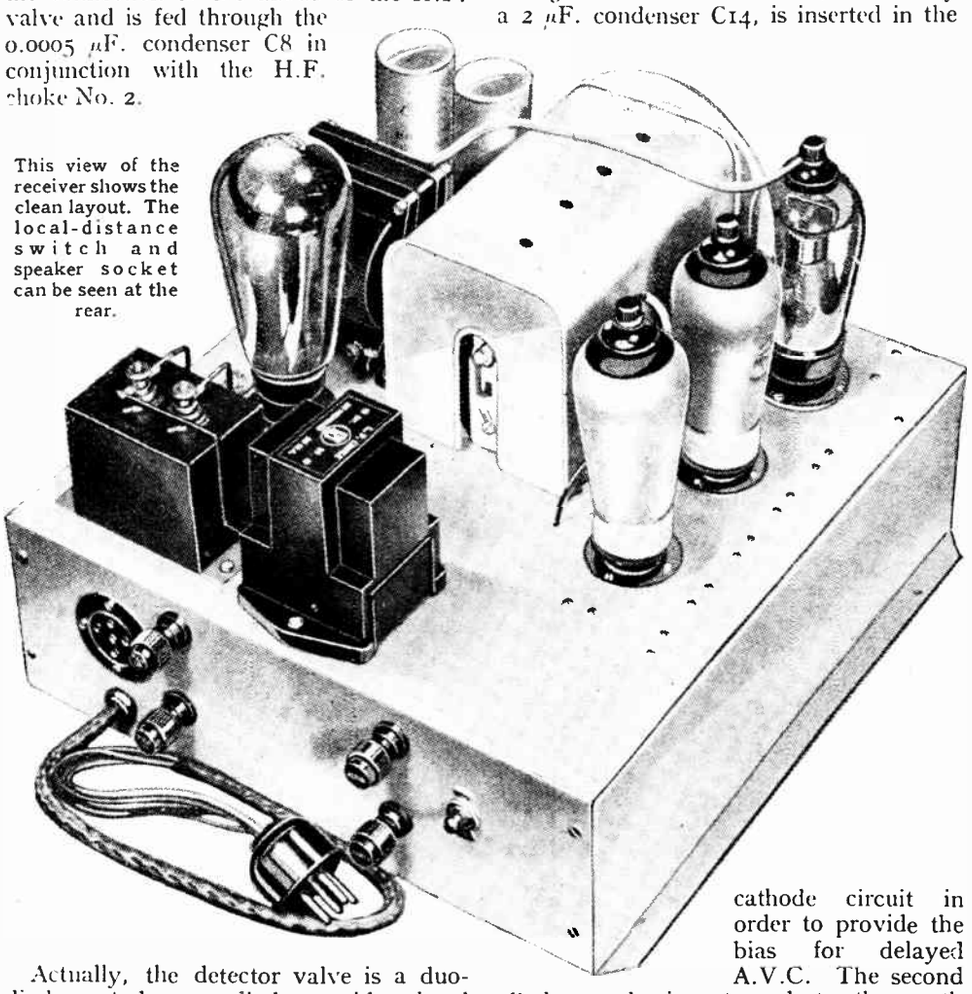
The A.V.C. Straight Four—

remain accurate on the two wavebands, the long wave coil has a separate aerial tapping to which the aerial lead is transferred by the switching.

A 0.0001 μF. (0.0001 microfarad) condenser C1 is inserted in the grid lead to the H.F. valve and a 2 megohm grid leak R1 permits the application of negative grid bias from the A.V.C. system. The coupling between the two H.F. stages is by means of a band-pass filter arranged to give high selectivity while permitting the retention of the upper sideband frequencies. The primary circuit of the filter is choke fed from the first valve by means of the choke No. 1 and the 0.0005 μF. condenser C5, which is connected to a tapping point on the tuned circuit to minimise valve damping and to ensure stability.

The A.V.C. System

The detector is of the diode type which allows distortionless rectification to be obtained. As the input impedance of such a rectifier is only moderate, its input is obtained from a tapping on the single tuned circuit which provides the coupling between the second H.F. and detector stages. The same tapping point serves for the connection to the anode of the H.F. valve and is fed through the 0.0005 μF. condenser C8 in conjunction with the H.F. choke No. 2.



This view of the receiver shows the clean layout. The local-distance switch and speaker socket can be seen at the rear.

Actually, the detector valve is a duo-diode-pentode; one diode provides signal rectification and is fed through the 0.0001 μF. condenser C10, while the other receives the H.F. input through C13 of 0.0001 μF. The 250,000 ohms resistance R12 serves as the manual volume control, and is operative on both radio and gramophone, and it acts also as the diode load resistance. The filter comprising choke No. 3 and the 0.0001 μF. condenser C12 are included to prevent H.F. currents from reaching the pentode control grid.

When a signal is applied to the detector, rectification occurs in the diode circuit and there appear across R12 a steady potential proportional to the signal input and the L.F. potentials due to the modulation of the signal. The desired proportion of the latter are passed to the control grid of the pentode through the 0.1 μF. condenser C15, but the whole of the steady potential is applied to it as bias by the 2 megohms resistance R13. As the pentode of the variable-mu type, its amplification thus decreases with increasing signal strength.

A 500 ohms resistance R11, shunted by a 2 μF. condenser C14, is inserted in the cathode circuit in order to provide the bias for delayed A.V.C. The second diode anode is returned to the earth line through its 0.5 megohm load resistance R9, and is consequently biased negatively by the drop along R11. As a result, nothing happens in this circuit until the signal input exceeds the delay voltage. When this occurs, however, rectification takes place, and a steady potential appears across R9, which is applied through the filter circuit R8 and C11 to the grids of the H.F. valves and so reduces their amplification. In this way, not only the two H.F. valves, but also the first L.F. stage, are controlled for A.V.C. purposes.

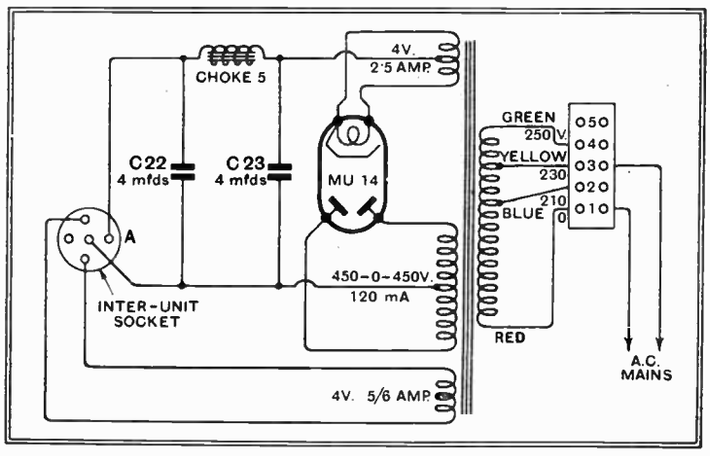


Fig. 2.—The eliminator includes only the mains equipment and the first stage of smoothing.

The primary of the L.F. transformer coupling the duo-diode-pentode to the output valve is included in the anode circuit of the pentode. Since this valve has a high internal A.C. resistance, the transformer primary is shunted by a 20,000 ohms resistance R16 in order to prevent a loss of bass. The valve anode is fed from the 200 volts H.T. line through the 20,000 ohms decoupling resistance R15 with an 8 μF. electrolytic by-pass condenser C18 shunted to earth.

The Output Stage

The output valve is of the type rated for 25 watts anode dissipation and will deliver an undistorted output of nearly 6 watts. The usual anti-parasitic oscillation resistances R17 and R19 are included and the grid circuit is decoupled by the 50,000 ohms resistance R18 and the 1 μF. condenser C19. A choke filter output circuit is employed, for the loud speaker is of the type fitted with a high impedance speech coil and consequently requires no impedance-matching transformer. The valve is of the directly heated type, and a 30 ohm potentiometer R20 is connected across its filament, the slider being taken to earth through the bias resistance R22 of 500 ohms. This is adopted in order that any hum introduced by the filament supply may be balanced out by the adjustment of the potentiometer.

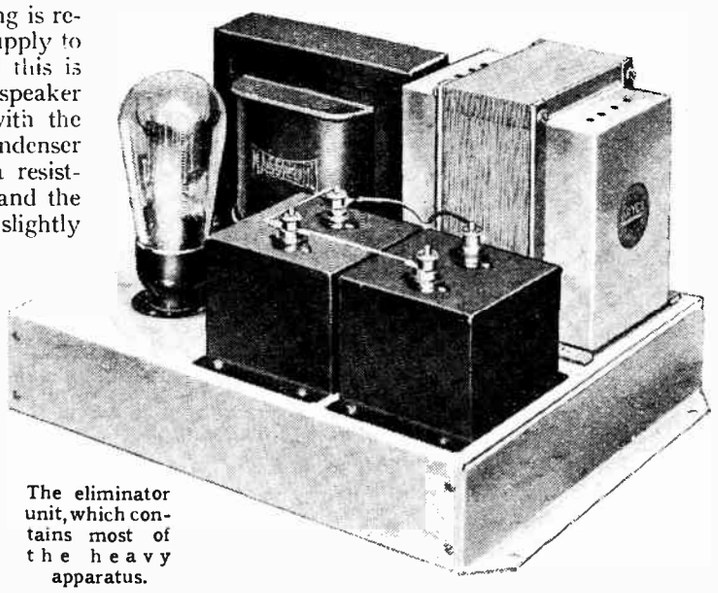
The circuit of the mains equipment is shown in Fig. 2, and it will be seen to consist of the mains transformer, rectifier, and the first stage of smoothing. The rectifier valve is one of the new indirectly heated types which removes the necessity for a thermal delay switch, and it delivers an output of 455 volts at about 110 mA. across the 4 μF. condenser C23. The choke No. 5 is rated for an inductance of 28 henrys at 120 milliamperes and provides

The A.V.C. Straight Four—

the initial smoothing in conjunction with the 4 μF. condenser C22. The potential available across this condenser is about 430volts and is applied directly to the output valve. A certain drop in voltage occurs in the output choke No. 4 (Fig. 1) so that the true anode voltage on the output valve is slightly below its maximum rating of 400 volts.

Additional smoothing is required for the H.T. supply to the early valves, and this is obtainable from the speaker field in conjunction with the 8 μF. electrolytic condenser C21. The field has a resistance of 5,000 ohms, and the current through it is slightly under 50 milliamperes, so that the voltage drop across it is about 240 volts, and a supply of 190 volts is available for the nominally 200 volts line.

The anodes of the H.F. valves are fed from this through 1,000 ohms decoupling resistances R4 and R7, with decoupling condensers C4 and C9 joined to earth. The screen grids, however, are not fed from a potentiometer in the usual way, but merely through a single dropping resistance. This is made possible by the use of H.F. pentodes for the H.F. stages, since the screen current in these valves is much more constant than usual. A further point in favour of this method of feeding the screens lies in the increased input handling capacity of the valves at high A.V.C. bias voltages, although this is to some extent offset by the necessity for using a higher bias for a given reduction in signal strength. These effects, of course, are brought about by the fact that the screen voltage rises as the bias is increased. It should be noted that one pole of the radio-gramophone switch is so connected that on gramophone it open-circuits the screen feed, thus effectively preventing any break-through of radio signals when records are being reproduced.



The eliminator unit, which contains most of the heavy apparatus.

The Mains Equipment

The screen of the duo-diode-pentode is fed from the 200 volts line through a 20,000 ohms resistance R14, with a 1 μF. decoupling condenser C16. Minimum bias on the H.F. stages is provided by the drop of voltage along the 600 ohms resistances R2 and R6, which are shunted by 0.1 μF. condensers C3 and C7. In the case of the first H.F. stage it will be noted that the cathode circuit includes also a 2,000 ohms resistance R3 which can be short-circuited by the switch S1. The purpose of this is to avoid any possibility of distortion due to overloading when listening to the local station. For reception of a powerful station the switch can be opened and the initial sensitivity of the set reduced, thus lessening the strain upon the A.V.C. system.

It will have been observed that the mains transformer has only a single winding for the heater supply to all the valves, apart from the mains rectifier. Hitherto, it has been necessary to employ a separate winding for a directly heated output valve, for its bias voltage otherwise appears as a potential difference between the heaters and cathodes of the other valves. Recent progress in valve development, however, has made this unimportant, and it is now possible safely to adopt a single transformer winding for all valves.

The assembly of the components, wiring up, and the operation of the receiver will be dealt with in next week's issue.

THE LIST OF PARTS.

Receiver Unit

1 4-gang condenser — Polar "Star Minor"
1 Dial for above — Polar "Full-Vision" Semicircular Drive
1 Set of 4 Ferrocart coils on chassis, consisting of F.10, F.11, F.12 and F.13 — Colvern
3 Screened H.F. chokes, Ch1, Ch2, Ch3 — Bulgin H.F.9
2 Electrolytic condensers, 8 mfds., 450 volts peak working, C18, C21 — Dubilier (Peak, T.C.C.)
1 Fixed condenser, 2 mfds., 550 volts, D.C. working, in rectangular metal container, C20 — Dubilier L.C.G.
1 Fixed condenser, non-inductive, 2 mfds., 250 volts, D.C. working, in cylindrical aluminium container C14 — Dubilier 9200
2 Fixed condensers, non-inductive, 1 mfd., 250 volts, D.C. working, in cylindrical aluminium containers, C16, C19 — Dubilier 9200
7 Fixed condensers, non-inductive, 0.1 mfd., 250 volts, D.C. working, in cylindrical aluminium containers, C2, C3, C4, C7, C9, C11, C15 — Dubilier 9200
5 Fixed condensers, 0.0001 mfd., C1, C6, C10, C12, C13 — Dubilier 665
2 Fixed condensers, 0.0005 mfd., C5, C8 — Dubilier 665
1 Fixed condenser, 0.0005 mfd., C17 — Dubilier 670
1 Resistor, 30 ohms, R20 — Claude Lyons "Humdinger"
1 Wire-wound resistance, 7,500 ohms, 20 watts, R21 — Bulgin PR.10
1 Resistance, 100 ohms, 1 watt, R19 — Erie
1 Resistance, 500 ohms, 1 watt, R11 — Erie
1 Resistance, 500 ohms, 3 watts, R22 — Erie
2 Resistances, 600 ohms, 1 watt, R2, R6 — Erie
2 Resistances, 1,000 ohms, 1 watt, R4, R7 — Erie
1 Resistance, 2,000 ohms, 1 watt, R3 — Erie
1 Resistance, 5,000 ohms, 1 watt, R17 — Erie
3 Resistances, 20,000 ohms, 1 watt, R14, R15, R16 — Erie
1 Resistance, 25,000 ohms, 1 watt, R10 — Erie
1 Resistance, 50,000 ohms, 1 watt, R18 — Erie
1 Resistance, 500,000 ohms, 1 watt, R9 — Erie
1 Resistance, 1 megohm, R8 — Erie
3 Resistances, 2 megohms, R1, R5, R13 — Erie
(Dubilier, Graham Farish, Claude Lyons, Seradex.)
1 Tapered volume control, 250,000 ohms, R12 — Magnum (Claude Lyons, Watmel.)
1 L.F. transformer, 1 : 3½ — Ferranti AF5
1 L.F. choke, 20 henrys, 60 mA., Ch4 — R.I. DY51
4 Valve holders, 5-pin — Clix Chassis Mounting Standard Model
1 Valve holder, 7-pin — Clix Chassis Mounting Floating Model
1 Double-pole changeover switch, S2 — Bulgin S.98
1 On-off toggle switch, S1 — Bulgin S.102
(Claude Lyons.)
1 5-way connector — Wilburn
1 5-way battery cable, with twin 70/36 leads — Harbros
2 5-pin plugs — Bulgin P.3
2 Knobs — Bulgin K.14
4 Ebonite shrouded terminals, A., E., pick-up (2) — Belling-Lee "B"
2 Lengths screened sleeving — Harbros
1 Metal chassis, complete with screws, nuts and washers — Haynes Radio
6 Lengths Systoflex, 2 ozs. No. 20 tinned copper wire, etc.
Valves:—2 Mullard VP4, or Ferranti VPT4, 1 Cossor DD/Pen., 1 Mazda PP5/400 or Marconi or Osram PX25.

Power Unit

1 Mains transformer, Primary: 200 to 250 volts, 50 cycles; secondaries: 450-0-450 volts, 120 mA. 4 volts 2.5 amps. centre-tapped; 4 volts 5/6 amp. With screened primary. — Bryce AB573/c
1 L.F. smoothing choke. 26 henrys, 120 mA., 140 ohms, D.C. resistance, Ch5 — Savage "Massicore" RC27M
2 Fixed condensers, 4 mfds., 550 volts, D.C. working, in rectangular metal containers, C22, C23 — Dubilier L.C.G.
2 Valve holders, 5-pin — Clix Chassis Mounting Standard Model
1 5-way connector — Wilburn
1 Metal chassis, complete with screws, nuts and washers — Haynes Radio
2 Lengths Systoflex, 1 oz. No. 20 tinned copper wire, etc.
1 Loud speaker, with 5,000 ohms field, and high impedance speech coil for PP5/400 valve — Baker's S.P.D. Black Cone
Valves:—1 Marconi or Osram MU14.

THE RADIO INDUSTRY

AS befits members of a new industry, Partridge, Wilson & Co. (makers of Davenset apparatus) apparently hold progressive views on the employers' obligations towards employees. Their workpeople have just been given an all-round increase of 5 per cent. in wages. This is the second general increase during the year, and, in addition, a successful profit-sharing scheme is in operation.

The production of McMichael receivers for the month of October constituted a record for the firm. To celebrate the event, Mr. Leslie McMichael, a well-known figure both in amateur and trade circles, himself engraved the serial number plate for the last set to pass out of the test-room on October 31st.

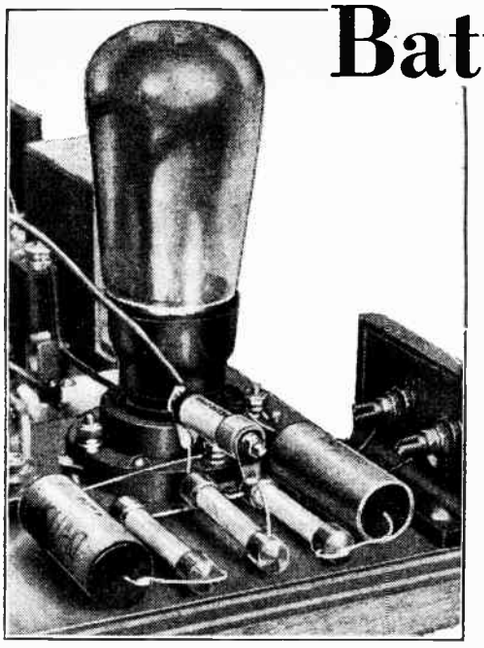
The Edison Swan Electric Co., Ltd., are to market electrically operated Bulle clocks, both in mains- and battery-driven models.

The Sunbeam Electric Co. is shortly to occupy a new and larger factory in Park Royal Road, London, N.W.10.

The latest publication issued by Claude Lyons, Ltd., of 76, Oldhall Street, Liverpool, is justly entitled "A Helping Hand to Set Constructors." In addition to full technical descriptions of the many components and accessories produced by this firm, it includes many pages of circuit diagrams and technical notes. Readers may obtain copies by sending 3d. in stamps.

New Mullard valves.—Indirectly heated power rectifiers, types IW2 and IW3, giving rectified outputs of 60 milliamps at, respectively, 250 volts and 350 volts. As compared with the ordinary directly heated rectifier, the outstanding advantage of this new type is that an initial voltage rise, with consequent risk of damage to condensers, is avoided.

"This Year of Radio" is the title of an unusual and highly informative catalogue issued by Alfred Imhof, Ltd., 112-116, New Oxford Street, London, W.C.1, the well-known gramophone and radio dealers. All popular sets, radio-gramophones, and accessories are described at length; there are several "magazine" articles, and space is devoted to the "service" policy of the firm.



Battery Economy with the "Westector"

Automatic Bias Adjustment in the Output Stage

THE majority of this season's battery receivers are fitted with Class "B" or Q.P.P. output stages which have superseded the single output valve with normal bias. The conversion of existing sets for battery economy is, however, a comparatively simple and inexpensive process if use is made of the latest metal oxide rectifiers.

ALTHOUGH the majority of economical output stages employ two valves in some form of push-pull arrangement, it is quite possible to achieve comparable results with a single output valve. A valve biased to the middle of the straight portion of its characteristic is always consuming H.T. current at the rate required for its maximum power output. During the greater part of the time that the set is in operation a high bias and consequently a much lower average current can be tolerated without introducing appreciable distortion.

The essence of the scheme lies in tapping off a small fraction of the L.F. output, rectifying it and applying the resultant voltage to bias the output valve according to the power which it is called upon to handle. The Philips 832B receiver employs such an arrangement, a leaky grid triode rectifier being used to regulate the control bias in accordance with the input voltage.

R.C.C. or Transformer Coupling

Where it is desired, however, to modify an existing battery receiver for economical working the "Westector" undoubtedly offers a better solution than the addition of a valve, for not only is the conversion cheap in first cost but it does not involve any further expenditure of filament current.

The principle of operation will be best understood by reference to Fig. 1, which shows a pentode output valve preceded by resistance-capacity coupling and feeding a moving-coil loud speaker. It will be found that pentodes give the best results in circuits of this type, as they show a better range of control for a given quiescent current. Transformer coupling could equally well be employed, but is not absolutely necessary as it is in the case of Class "B" output.

How the Bias is Derived

The grid bias battery should be capable of supplying approximately twice the normal bias voltage required by the valve. It is connected to the lower end of a potential divider (R_1 R_2) which is connected to the anode through the blocking condenser C_1 and by-passes a small fraction of the fluctuating output current. The effect of connecting the "Westector" across R_2 is to short-circuit R_2 for currents flowing upwards in the potentiometer, but to give it practically its full value for establishing a difference of potential from currents flowing downwards. The net result is the establishment of a voltage in opposition to the bias and of a strength depending on the signal. The resultant bias is led off to the grid circuit through the resistance-capacity filter R_3, C_2, the time constant of which is adjusted to give rapid response to a change of signal strength, but at the same time to prevent low-frequency voltages being fed back to the grid circuit.

The value of R_1 determines the fraction of the output voltage available for control, and must be chosen with care for every type of valve. Too high a resistance will result in bottom bend rectification due to insufficient reduction of the standing bias, while too low a value will cause the valve to run to grid current. A certain amount of distortion is bound to occur in any type of quiescent output stage, but by judicious compromise in the choice of component values the harmonic distortion can be kept low over a considerable range of output power.

The table shows suitable values for R_1 and relevant operating conditions for a number of popular 2-volt battery output valves.

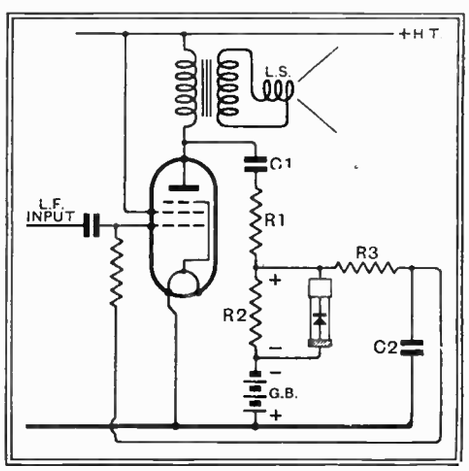


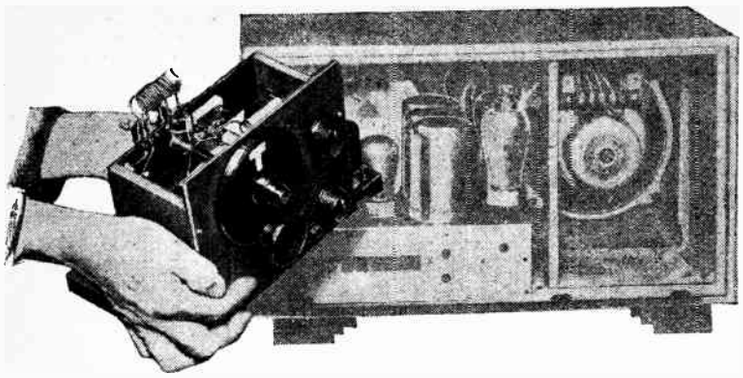
Fig. 1.—Battery economy output circuit using the "Westector" type W6. The value of R_1 depends on the valve and is given in the table, R_2, 50,000 ohms; R_3, 250,000 ohms; C_1, 0.25 mfd.; C_2, 0.1 mfd.

These figures are the result of a series of experiments in the Westinghouse laboratories in which use has been made of the cathode ray tube to detect the commencement of wave-form distortion, and hence the limits between which opposing factors may be varied without prejudicing the resultant performance.

Bearing in mind that no expenditure of H.T. or L.T. current is required by a driver valve, as would be the case in Class "B," and that only three fixed resistances and two by-pass condensers are required in addition to the "Westector," there can be little doubt that this method of applying the principle of battery economy should find wide acceptance among those wishing to modernise their obsolete battery receivers.

Valve.	Battery Volts.	R_1 Ohms.	G.B. Volts.	Quies. Current. mA.	Peak Current. mA.	Grid Swing. Volts.	Anode Load. Ohms.	Output mW.
Pen. 220A ..	150	100,000	16½	2.0	20	9	7,500	1,100
Pen. 220A ..	120	100,000	13½	1.3	16	7.5	9,000	700
220 P.T. ..	120	100,000	13½	1.3	16	7.5	9,000	640
Pen. 220 .. / 220 HPT. .. / P.T. 2	150	150,000	9	1.6	10	4.5	17,000	500
P. 220A .. / P. 2	150	20,000	27.0	2.0	14	14	4,000	300
P. 220 .. .. / L.P. 2 .. .. / 220 P.A. ..	150	60,000	13½	0.75	5.5	7	10,000	150

Values of R_1 and operating conditions for a number of 2-volt output valves.



Ultra Short-Wave Superheterodynes

By W. T. COCKING

Receiving 5-7 Metre Television Transmissions with Simple Apparatus

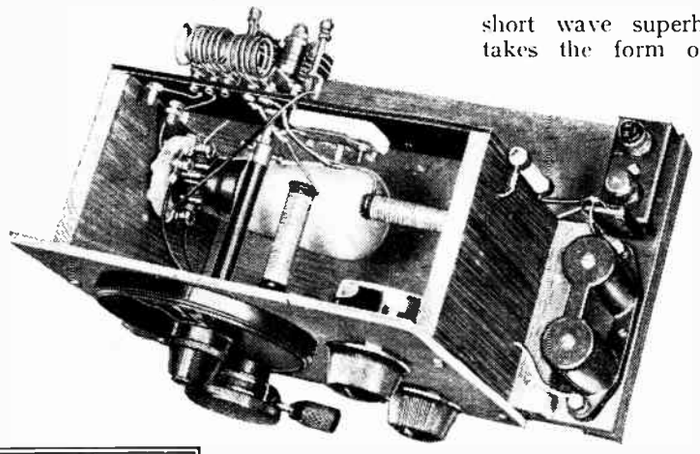
THE ultra-short waveband offers an ideal field for the further development in television, as adequate ether space is available for the higher picture frequencies necessary for good definition, The small superheterodyne adaptor described here provides the means to acquire some experience in the reception of these very short waves

RECENT articles in *The Wireless World* have shown that the only hope of high-quality television broadcasting lies in the ultra-short waveband around 5 metres. Comparatively little is yet known about the properties of these wavelengths and about the design of transmitters and receivers for specific purposes. Until recently it was believed that the range of an ultra-short wave transmitter was limited to the optical distance, that is to say, it could be received only at points within the boundary set by the horizon as viewed from the transmitting aerial. It has now been discovered, however, that this range can be greatly exceeded, and the practical limit is usually set at about twice the optical distance. In view of this, it does not seem improbable that with improvements in transmitters and receivers still greater distances may be covered in the future.

The difficulties attendant upon the design and operation of a 5-metre set will be realised when it is remembered that 5 metres represents a frequency of no less than 60,000 kc/s. At such high frequencies tuning coils and condensers assume very modest proportions, and stray capacities and even the inductances of connecting leads play an important part. Since transmissions on these high frequencies are rapidly attenuated, and, so far as is known at present, reliance must be placed entirely upon the direct ray for reception, it is evident that a highly sensitive receiver is called for.

Advantages of the Superhet

Straight H.F. amplification is barely possible and the detector L.F. set is not sufficiently sensitive, so that the superheterodyne and the super-regenerative set vie for popularity. The latter is extremely useful, and a good example was described recently in the pages of this journal.[1] There are, however, limitations to the maximum sensitivity which can be obtained with this system. The superheterodyne, therefore, offers the greatest hope, and this is particularly the case when high-quality reception is required, as it will be if television on this wavelength is established.



A simple and straightforward construction is adopted as shown by this view.

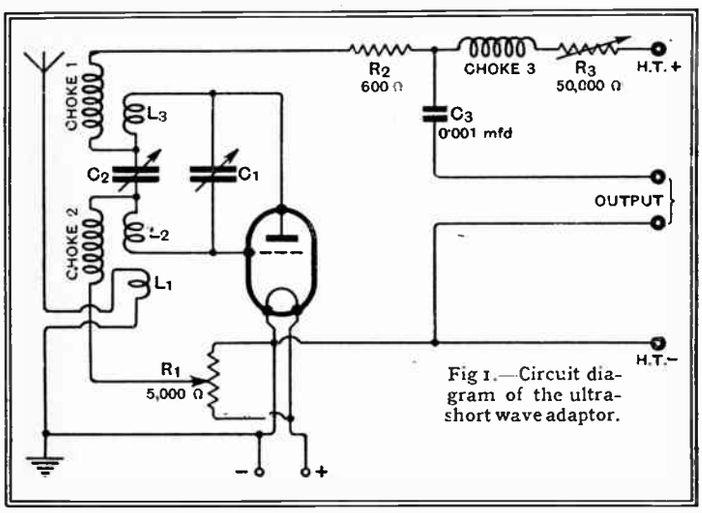


Fig 1.—Circuit diagram of the ultra-short wave adaptor.

At the present time only a frequency changing unit is necessary for 5-metre reception, since any ordinary broadcast receiver of three valves or more can be used for the I.F. amplifier, second detector and L.F. circuits. The most practical ultra-short wave superheterodyne, therefore, takes the form of a battery-operated single-valve autodyne frequency changer for use in conjunction with any standard battery or mains-operated receiver.

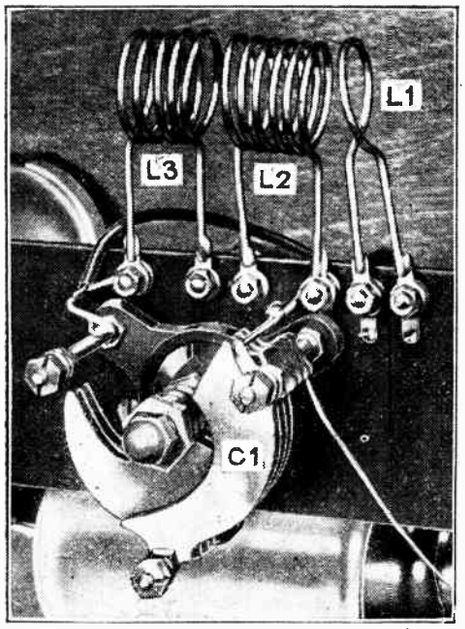
Experiment has indicated that the best general reception is obtained with the circuit arrangement shown in Fig. 1. A modified form of Hartley oscillator is used, and it will be seen that the centre point of the coils is joined through a semi-variable condenser C2 of about 70 mmfd. maximum capacity. The actual tuning capacity, therefore, consists of C2 in series with the variable condenser C1 of 40 mmfd.; in addition, of course, there are the various stray capacities. With the coils employed, about which more later, a tuning range of 5.5 to 7.5 metres is obtained, but this can be varied appreciably by altering the value of C2.

Experience has shown that for satisfactory operation it is necessary for the valve to slide smoothly into oscillation without threshold howl. Even although no such howl may be apparent when the valve is strongly oscillating, the best results are not obtained if the circuit conditions are such that a reduction in the anode voltage leads to howling. With most modern valves a slight positive grid bias is necessary to avoid howling, and a potentiometer R1 is fitted, therefore, to enable the optimum operating point to be readily determined.

[1] The Ultra Short Wave Two, *The Wireless World*, June 16th, 1933.

Ultra Short-wave Superheterodynes—

A variable resistance R3 is included in the anode circuit to permit a close adjustment of the anode potential. This is not



"Close-up" of small sub-panel from which the assembly of the coils and tuning condenser can be clearly seen. The variable resistance just visible to the left of the coils is R3 and the lettering corresponds with that of Fig. 1.

usually very critical, but the maximum sensitivity is obtained when the valve is only just oscillating. On the other hand, reception of a strong signal necessitates a greater amplitude of oscillation if distortion is to be avoided, and, apart from this, the adjustment of the anode voltage affects the oscillator frequency somewhat, so that the variable resistance can be used as a convenient fine-tuning adjustment. As might be expected, tuning is extremely critical, and a reduction ratio of over 500-1 is necessary. This is readily obtainable with the Igranic Indigraph Micrometer dial, but the closer adjustment obtainable by R3 is very helpful.

Constructional Details

The H.F. chokes Ch1 and Ch2 can readily be made by winding about 50 turns of fine wire on a length of ⅜in. tubing to a length of about one inch. Alternatively, the Eddystone type 947 may be used. In order to prevent the valve oscillating at a frequency determined by the chokes instead of the tuning coils, the 600 ohms resistance R2 is included. The choke Ch3 for the output feed circuit can be of any good quality type suited to the input of the receiver with which the converter is used.

The tuning coils are very simply made. The grid coil L2 consists of six turns of No. 16 tinned copper wire, while the anode coil L3 has five turns; a single turn suffices for the aerial coil L1. The coils are close wound on a ¾in. diameter former. When the tension is slackened the diameter increases somewhat and the former can be removed. The turns of the coil can then be pulled apart so that the spacing of the turns is rather less than the wire diameter. The method of mounting will be clear from the illustrations.

It is essential that the framework holding coils, condensers, and valve should be very rigid, for any vibration will make it impossible to hold a signal. In the layout adopted the valve holder is mounted on the left support, although this does not necessarily give the shortest wiring. It has, however, been found to be convenient where different types of valve are used. With a screen-grid valve, for instance, a very short anode lead can be obtained, and as the greatest sensitivity is obtained with this type, it is obviously the case when most advantage is obtained from short wiring.

In general, the receiver should be tuned to its most sensitive frequency, avoiding any setting upon which interference from broadcasting might occur, the lower end of the long waveband usually being best. The condenser C2 should be set at about one complete turn from full capacity. The slider of the potentiometer R1 should be placed at the negative end and R3 at maximum. Start with a tapping on the H.T. battery, usually about 60 volts, just insufficient to cause oscillation, and then reduce R3. If howling occurs when oscillation starts, adjust R1 to such a point that the valve will just slide into oscillation when R3 is reduced without any tendency to howl.

Operating Notes

With the Mazda HL2 valve employed in the experiments this condition was easily reached with a standing anode current in the oscillating condition of less than 2 mA. A strong signal requires stronger oscillation if distortion is to be avoided, however, and R3 must then be reduced until the current reads 6 or 8 mA.

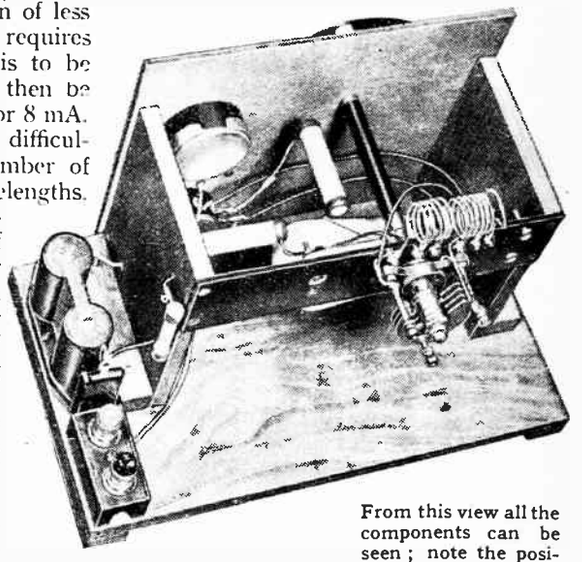
Initial testing may offer some difficulties on account of the small number of transmissions on ultra-short wavelengths. It is useful to remember, therefore, that the ignition systems of most cars radiate quite strongly at these high frequencies, and a passing car is usually distinctly audible, and provides a useful if intermittent, signal for testing purposes.

In cases where the set is to be used in the London area, and is intended chiefly for reception of the experimental transmissions from Crystal Palace and those conducted by the B.B.C., and the E.M.I., a triode oscillator valve is the best. At greater distances, however, a screen-grid valve is to be preferred on account of the higher sensitivity. The circuit remains the same with this type of valve, except for the provision of a screen feed. This should be decoupled by a 5,000 ohms resistance, and a 0.0001 μF. by-pass condenser connected between screen and −L.T. A screen potential of 60-80 volts with an anode supply of 100-120 volts is sufficient.

Experiments with this unit have been conducted in the heart of London, and with a three-valve receiver operating a loud speaker. Using a screen-grid frequency changer valve and no aerial the Baird transmissions on 6.25 metres from the Crystal Palace were received at such a strength as to cause an overloading effect in the first valve and serious distortion. It was found necessary, therefore, to change to a triode, for its greater input handling capacity reduced the risk of distortion due to overloading. Television transmissions on a wavelength of about 7.25 metres were also received at a similar strength. At such short ranges an aerial appears to be unnecessary, and this is doubtless accounted for by the large diameter of the coils in relation to the wavelength.

Available Transmissions

The unit has been tried with various receivers and with input circuits adjusted to various frequencies between 110 kc/s and 1,500 kc/s with equally good results. Transmissions on these wavelengths are not sufficiently numerous to make 5-metre reception of popular appeal, but it is undoubtedly of great experimental interest. At the present time Baird Television are conducting experimental transmissions from the Crystal Palace on a wavelength of 6.25 metres, and these consist alternately of gramophone records and television. On higher wavelengths both the B.B.C. and the Electrical and Musical Industries are transmitting, and there are numbers of amateurs throughout the country working at various times, so that in most districts some station should be easily receivable.



From this view all the components can be seen; note the position of the valve with the two special short-wave H.F. chokes suspended above it.

A few remarks about the choice of components may be of interest. The valve-holder should be of the low-loss type and the skeleton model marketed by K.P. Instruments is quite suitable. The semi-variable condenser C2 should be of rigid construction, and a Cyldon model was used in the original converter with an Eddystone 40 mmfd. microdenser, type Picut, for C1.

NEWS of the WEEK

Current Events in Brief Review

For the Critics

FOLLOWING the practice of the B.B.C., the Belgian broadcasting authorities have installed a critics' listening room in Radio House, Brussels.

More Trouble for Huizen

HUIZEN'S rival, the new 20-kW transmitter at Brasov, Rumania, scheduled to operate on the same wavelength, i.e., 1,875 metres, is, we learn, to start test transmissions on December 1st.

The Anti-interference War

NEWCASTLE RADIO SOCIETY is seeking permission to send a deputation to the Electricity Board to ask for legislation to be passed prohibiting the supply of electric current to any premises where plant is installed that causes electrical interference to wireless reception.

Nearing the Sixth Million

THE total number of licences in force at the end of October was 5,768,000, showing a net increase of 47,500 over the figures for the previous month.

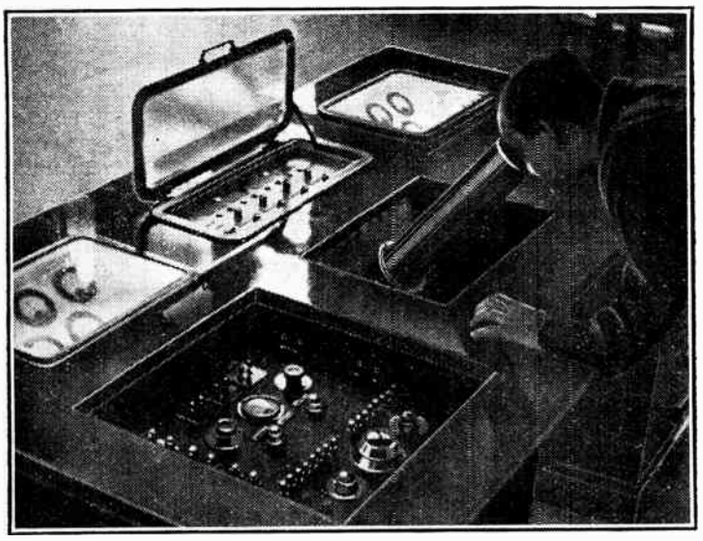
A Silent Show

SILENCE was the rule at the first wireless exhibition at Luxembourg, held from November 12th to the 20th. The Salon was sound-proof and visitors were requested not to converse too loudly so that patrons could judge the quality of the sets being demonstrated.

"Liquor on the Air"

DESPITE the death of Prohibition, it seems unlikely that American distilleries will be successful in their demands for "time on the air," writes our Washington correspondent. Already William S. Paley, president of the Columbia broadcasting system, has announced that his network will not carry any advertising of whisky, gin or other "hard liquors," though no reason is seen for refusing to carry programmes sponsored by beer and wine firms.

It is expected that the National Broadcasting Company will either follow suit or await the "shake-down" of the post-prohibition era before deciding what to do.



WATCHING THE MODULATION at Lakihegy, near Budapest, where Hungary's new 120-kilowatt is now testing. The engineer is studying the modulation curve in a cathode ray oscillograph.

The "No Capacity" Condenser

"THE first entirely capacity-free variable condenser" was the startling description of a new condenser in the window of a Copenhagen radio dealer, writes our Danish correspondent, and Copenhagen fans agreed that this must be "the real thing" in *silent* tuning. Actually, the condenser is specially shielded from hand capacity effects.

Novel Running Commentary

A NOVEL experiment was tried at the recent Copenhagen Traffic Exhibition where visitors gathered before a model of the modern Diesel-engined ferry *Sjaelland*, were able to listen to a description by wireless given by an engineer aboard the actual ferry sailing between Korsor and Nyborg. Spectators were able to put questions to the engineer *via* the short-wave transmitter at Skamleback, the answers being reproduced by a loud speaker.

Broadcasting from Egypt

ALL private wireless stations in Egypt are to be suppressed with the opening of the new broadcasting station at Abou Zaabal. The Government representatives on the programme committee will include the sub-director of the Police Department, besides Dr. Aly Pacha, Dean of the Faculty of Medicine, and Mohamed Hassanein, Inspector of Educational Establishments. The station is to be worked by the Marconi Company.

Wireless on Tap in Holland

HOLLAND now has 613,997 registered listeners, or 74 per thousand of the population. Of this total only 316,956 possess wireless receivers; no fewer than 297,041 subscribe to the wired relay systems.

A Lucky Listener

A VALUABLE gold watch and albert chain is to be presented to the 500,000th subscriber to the Austrian broadcasting service. The last reported figure was 495,407, and it is expected that the lucky licensee will put in an appearance within the next few days. The licence figures have jumped considerably since the recent improvements to the Bisamberg station.

Amateurs and U.S. Navy

IN view of the success achieved with the new Royal Naval Wireless Auxiliary Reserve in this country, it is interesting to note that its "opposite number" in the U.S. was recently addressed by radio from the Washington station by the Secretary of the Navy, the speech being copied by some five hundred radio amateurs all over America.

During the past year the Naval Communication Reservists of the Radio Relay League have taken a very prominent part in emergency working in connection with the California earthquake, the loss of the Akron, the Ohio river flood and recent storms and hurricanes.

R.S.G.B. Standard Frequency Transmissions

ACCURACY to within 0.01 per cent. is claimed for the new standard frequency transmissions covering the 3.5 kc. band which begin on Sunday next, November 26th, from G6NF, West Norwood, London, S.E.27, under the auspices of the R.S.G.B. These transmissions, which are to be made on the last Sunday of each calendar month, will adhere to the following schedule:—

09.30 .... 3525 kcs (85 metres)
09.40 .... 3625 kcs (82.75 metres)
09.50 .... 3725 kcs (80.6 metres)

The call will consist of R.S.G.B. interspersed with ten-second dashes and statement of frequency. An input of 100 watts to the final amplifier should be adequate to cover the British Isles. Reports of reception will be welcomed by the R.S.G.B.

Why Witzleben Broke Down

THE mystery of the breakdown of the Berlin-Witzleben transmitter during the great Hitler speech on November 10th is cleared up by the explanation that the engineers were being too careful. It seems that the engineers feared that the switching off of so many factory lights at the beginning of the speech would mean a disturbance on the power line, so they decided to run the Witzleben transmitter off its reserve Diesel engine. Unhappily, the Diesel engine broke down, and it was necessary to switch over to the mains in the middle of the Chancellor's speech. The interruption to listeners was of less than a minute's duration.

What Next?

A METZ journal is exhibiting in its windows a wireless receiver contained in a fountain pen. This should be an ideal contrivance for radio critics.

"O.B." Misses Fire

DURING the recent State Lottery Draw before a huge crowd at the Trocadero, Paris, microphones were present for the broadcasting of the impressions of the lucky ones as their tickets were drawn. Unfortunately, no one present drew a prize.

Disappointed Teachers

LATEST among those endeavouring to dodge the new French radio tax are the schoolmasters, many of whom have suddenly decided to install "school radio sets" in the hope that these would be exempted from tax. But the law states that receivers are only exempted if permanently installed in class-rooms; many teachers have been using their sets "after hours."

"Ultra-shorts" in the Air

THE recent ultra-short wave 'plane tests in this country are recalled by the news that 5-metre transmissions are now being conducted daily from the weather research 'plane of the Massachusetts Institute of Technology, flying at heights of from 500 feet to nearly four miles above Boston.

The transmissions, which are telephony, give weather information recorded on automatic instruments fastened under the wings of the 'plane. The American Radio Relay League, which considers the investigation to be the most important of its kind ever attempted, has notified all listeners in the U.S. and Canada to listen and report on reception conditions. During the descents each day special broadcasts for the benefit of amateur operators are made at intervals of 500 feet.

International Amateur Broadcasts

THE International DX'ers Alliance announces the following transmissions during the coming week. All times shown are G.M.T.:—

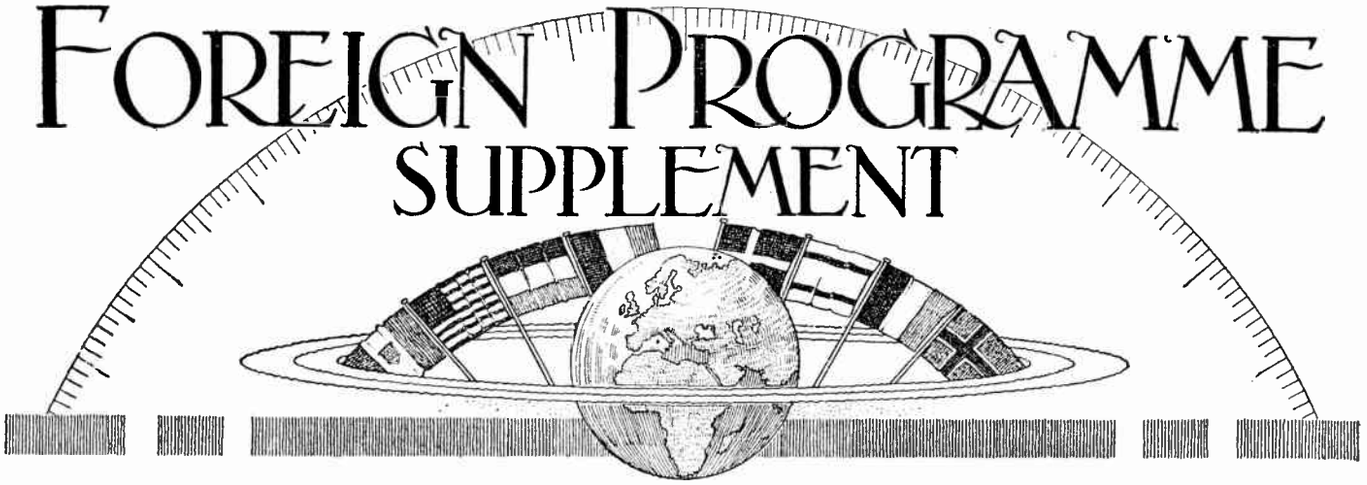
Nov. 26.—8.30-9.30 a.m.	CX26.	Montevideo. 585 kc/s.	512 m.
Nov. 27.—6-7 a.m.	XEPN.	Piedras Negros. 600 kc/s.	500 m.
Nov. 27.—8.30-9.30 a.m.	CP4.	La Paz. 6,080 kc/s.	49.3 m.
Nov. 30—5.30 a.m.	H I X.	Santa Domingo 579 kc/s.	519 m.
Nov. 30—5.30 a.m.	H I X.	Santa Domingo. 6,000 kc/s.	50 m.

Reports are welcomed by the I.D.A., 1018, North Prairie Street, Bloomington, Illinois, U.S.A.

Page 409 follows after the Programme Supplement.

The Wireless World

FOREIGN PROGRAMME SUPPLEMENT



SUNDAY

NOVEMBER THE TWENTY-SIXTH

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s 224.4 metres.—1.0 to 4.0 p.m.,** Programme by the I.B.C. (Ireland), Ltd. **1.0,** Broadcast of Dance Music. Black Rhythm; Can't we meet again?; The Night is gone (Castillo); I cover the Waterfront (Heymann); My Wishing Song (Kahal); Lazybones (Mercer); Pink Elephants (Woods); Sophisticated Lady (Ellington). **1.30,** Concert. Dixie Doorway (Parish); I can't forget the Night we met (Clifford); The Whisper Waltz (Burke); Adorable (Whiting). **1.45,** Concert of Popular Music. Selection from The Desert Song (Romberg); Trouble in Paradise (Wever); Song: Less than the Dust, from Indian Love Lyrics (Woodforde-Finden); The Blue Danube (Strauss). **2.0,** Concert of Light Music. Ständchen (Heykens); Duet: Indian Love Call from Rose Marie (Friml); The Bumble Bees' Wedding (Clare); Selection from Wonder Bar (Farcas). **2.15,** Concert. The Last Round Up (Hill); Waltzing alone with you (Gerald); What have we got to lose? (Kent); I couldn't tell them what to do. **2.30,** Concert. Selection from Coppélia (Delibes); Barcarolle from The Tales of Hoffman (Offenbach); Song: Myself when young (Lehmann); Waltz, Liebeslied (Kreisler). **2.45,** Accordion Band Music. Overture, Trieste (Pietro); Festival March (Michael); Waltz, Lorentina (arr. Macari); Coal Black Mammy (St. Helier). **3.0,** Concert by Tony Reddin and his Radiolians. Sweep; Happy as the Day is long; My Gipsy Rhapsody; Rhythmic Russian Rhapsody; I'll show you off; Don't be late in the Morning; Musical Comedy Selection from New Moon; Cowboy Joe; Letting in the Sunshine; Rock-a-bye Moon; One more Hour of Love; Little Beggar Man; Selection from No, No, Nanette; Let's all be happy together; Sunset Land; Japanese Sandman; Signature Tune: Let's call it a Day. **3.30** Time Signal. **3.31,** Concert by the Station Orchestra. **9.0,** Relay from Ennis Cathedral. **10.0,** Concert by John Stephenson and Company with the Station Orchestra. **10.45,** Athletic and Sports Talk. **11.0,** Time, News, Weather and Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**11.0 a.m.,** Chimes from the Cathedral and Weather. **1.0 p.m.,** Gramophone Music. In the interval at **1.30,** Theatre Notes. **2.0,** Sextet Concert. **3.0,** Programme for Hospitals and other Benevolent Institutions. **4.0 to 5.30,** Interval. **5.30,** Agricultural Talk and Gramophone Music. **6.0,** An Opera relayed from the Gran Teatro del Liceo. **9.0,** Gramophone Music. **10.45,** Chess Lesson. **11.0** (approx.), Close Down.

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**6.0 p.m.,** Popular Music on Gramophone Records. **6.30,** Song Recital by Zica Tomic. **7.0** Talk. **7.30,** Military Band Concert. **9.15,** Time Signal, Sports Notes and News. **9.30** (approx.), Cigány Music from the Knez Mihailo Restaurant.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**5.15 a.m.,** Gymnastics. **5.30,** To-day's Motto. **5.35,** Harbour Concert, from **Hamburg. 7.0,** Agricultural Programme. **7.55,** Chimes from the Potsdam Garrison Church, followed by Divine Service. **9.5,** Weather Report. **9.10,** Interval. **10.0,** Recitation from The German Lord's Prayer (Carl Ludwig Löhe). **10.15,** Weather. **10.30,** See **Leipzig. 11.0,** Orchestral Concert, conducted by Karl Schlichting. **11.55,** Time Signal. **12 Noon,** Concert, from **Leipzig. 1.0 p.m.,** Programme for Children. **2.0,** Talk. **2.30,** Concert. **4.0,** Goetz Otto Stoffregen reads from his own Works. **4.30,** Programme in commemoration of Dead Singers and Orators. **5.30,** Death, where is thy Sting?—Readings from German Mystics. **6.30,** Memorial Programme, from **Potsdam,** Choral and Orchestral Music. **7.15,** Maria Stuart—A Drama (Schiller). **9.0,** News. **9.45,** Weather. **10.0,** See **Langenberg. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—10.30 a.m.,** See **Leipzig. 11.0,** See **Hamburg. 1.0 p.m.,** Interval. **1.30,** Radio Report from the Oceanographical Museum. **2.15,** Radio Report from the Berlin Cemetery. **2.30,** Sports Notes. **3.0,** See **Heilsberg. 5.0,** Gramophone Concert. **5.30,** The Human Face—Radio Report on a Collection of Death Masks. **5.50,** Das Grosse Totenspiel—Play (Ernst Wiechert), with Music by Werner Egk. **6.50,** Sports Notes. **7.0,** Lottery Announcements. **7.5,** Organ Recital by Karl Linder, with the Berlin Station Orchestra, conducted by Hans von Benda. **7.40,** Totenfeier (Oscar Wappenschmitt), by the Berlin Station Choir and Orchestra, conducted by the Composer. **8.5,** Sleep, Dreams, and Death—Programme arranged by Ruth Schaumann, with Music by Fritz Stuhlmacher. **9.0,** News. **9.15** (approx.), Gramophone Records of Light Music. In the interval, Music by the Berlin Station Choir. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**6.0 p.m.,** See **Prague. 7.20,** See **Brno. 8.0,** See **Prague. 10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—10.30 a.m.,** See **Leipzig. 11.0** (approx.), See **Berlin (Deutschlandsender). 1.0 p.m.,** News. **2.25,** Programme for Children. **3.0,** Concert by the Station Orchestra, conducted by Ernst Josef Topitz. In an interval from **3.50 to 4.10,** Reading. **5.0,** Talk with Pianoforte Illustrations: The Glorification of Death in the Dance of Death. **5.30,** Programme in Memory of those who fell in the Great War, relayed from the Nikolaikirche, Brieg. **6.0,** Sports Notes. **6.20,** String Quartet in D Minor (Schubert), on Gramophone Records. **7.0,** Die Geschichte einer Mutter (The History of a Mother)—Mystery Play in Five Scenes, with Music (Gerhard Ewald Rischka), from a Story by Hans Christian Andersen. **8.0,** News. **8.15,** Totentanz, 1933 (Peter Steinbach), Music by Ernst August Voelkel. **9.15,** Time and News. **9.45,** Concert by the Silesian Philharmonic Orchestra, conducted by Gerhard Ewald Rischka. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Janota. **4.30,** Pianoforte Recital by Anna Skalická. **5.0,** German Transmission: Song and Pianoforte Recital by Louise Krubl (Songs), Aekermann (Pianoforte), and Beran (Pianoforte). **6.0,** See **Prague. 7.20,** Slovak Folk Song Recital. **8.0,** See **Prague. 10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**9.45 a.m.,** Cookery Hints and Miscellaneous Announcements. **10.0,** Gramophone Concert. **11.0,** Concert by the Small Station Orchestra, conducted by Pierre Leemans. **12 Noon,** Concert by the Station Symphony Orchestra, conducted by Jean Kumps. Soloist: Robert Van Aert (Baritone). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Radio Orchestra, conducted by Charles Walpot. Soloist, Mme. Rambert (Songs). **1.30,** Monologues by Emile Deluc. **1.40,** Delibes Potpourri (Urbach). **1.50,** Radio Report of the Football Match, Belgium v. Denmark, relayed from the Heysel Stadium. **5.0,** Dance Music, relayed from the St. Sauveur Palais de Danse. **5.30** (approx.), Football Match Results. **6.15,** Gramophone Music. **6.45,** La lune de miel—Sketch (Désiré Grevesse). **7.0,** Gramophone Music. **7.15,** Religious Address. **7.30,** Talk on Music. **8.0,** Concert by the Station Symphony Orchestra. Soloist: Vera Prihoda (Kumps). **8.30,** La défense du bonheur—One-Act Play in Verse (Georges Garnir). **9.0,** Orchestral Concert (contd.). **10.0,** Le Journal Parlé. **10.10,** Concert by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW.—Programme in Flemish. **10.0 a.m.,** Orchestral Concert, conducted by Pierre Leemans. Soloist: Douliez (Pianoforte). **11.0,** Gramophone Music. **12 Noon,** Concert by the Radio Orchestra, conducted by Walpot. Soloist: Mme. Rambert (Songs). **1.0, p.m.,** Le Journal Parlé. **1.10,** Concert by the Symphony Orchestra, conducted by Jean Kumps. Soloists: Van Aerdt (Baritone), and Piette (Clarinet). **2.0,** Running Commentary on the Football Match, Belgium v. Denmark. **5.0,** Concert by the Radio Orchestra, conducted by Charles Walpot. In the interval at **5.30** (approx.), Sports Results. **6.0,** Pictures from an Exhibition (Mussorgsky), on Gramophone Records. **6.30,** Concert by the Small Station Orchestra, conducted by Pierre Leemans. **7.15,** Religious Address. **7.30,** Le Journal Parlé **7.55,** Music Review. **8.0,** Sissy—Operetta (Kreisler), relayed from the Royal Flemish Opera House, Antwerp. In the intervals, Humorous Programme by Remes and Le Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—**4.0 p.m.,** Concert of Variety Music by the Marco Orchestra. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Operetta Programme. In the intervals, Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **6.20 p.m.** till Close Down.—**11.20 a.m.,** Weather and Tides Report. **11.25,** Concert by the Opera House Orchestra, conducted by Zoltan Samy. Radio Chronicle in the interval. **1.0 p.m.,** Gramophone Music. **2.0,** Agricultural Talk. **2.45,** Military Band Concert. **3.30,** Talk on Petőfi. **4.30,** Talk. **5.0,** Concert with Popular Songs and Hungarian Melodies from the Café Ostende. **6.20,** Variety Items. **6.50,** Pianoforte Recital. **7.30,** Sports and Racing Results. **7.50,** A Comedy (Eugène Labiche). **8.35,** Concert by the Imre Magyari Cigány Orchestra, relayed from the Hotel Hungaria. **9.45,** Trio Concert from the Café Simplon.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek OXY, 49.4 metres. 11.0,** Time Signal and Chimes from the Town Hall. **11.2,** Concert by Louis Preil's Instrumental Ensemble. **12 Noon,** Talk in English: The Grand Tour of Scotland. **12.20 p.m.,** Talk in German: Discussion on Munich, Leipzig and other German Towns. **12.40,** Reading in French: La chatte (Colette). **1.0,** Divine Service, relayed from Holmens Kirke. **2.25,** Concert by the Radio Symphony Orchestra, relayed from Odd Fellows Hall. Conductor: Fritz Busch. Soloists: Tenna Frederiksen Kraft and Niels Hansen (Songs). **4.20,** Programme for Children. **4.50,** Gramophone Concert of Light Music. **5.20,** Talk: The Position of Science in Germany To-day. **5.50,** Weather. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk: The History of English Agriculture from 1850 till the Outbreak of the Great War. **7.0,** Time Signal from the Town Hall. **7.1,** The Hansen Family—Humorous Episode (Jens Locher). **7.15,** Concert of Folk Songs of the Nations by a Male Voice Choir, conducted by Wilhelm Rosenberg. In the interval, Reading of Folk Stories (Axel Olrik). **8.20,** Pianoforte Sonata, No. 3, in B Flat (Mozart), played by Folmer Jensen. **8.40,** Gramophone Records of Caruso. **8.55,** News. **9.5,** Readings. **9.15,** Concert of Swedish and Finnish Music by the Radio Orchestra, conducted by Emil Reesen. **10.0,** Dance Music, relayed from the Wivex Restaurant. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**8.45 a.m, to 12 Noon,** Programme in English by the I.B.C. **8.45,** Orchestral Music. The Skaters' Waltz (Waldteufel); Spanish Gipsy Dance (Marquia); Xylophone Solo: Snappy Sticks (Robbins); The Busy Bee (Bendix); Columbine (Garland); The Wedding of the Rose (Jessell); Pianoforte Solo: That Futuristic Rag (Bloom); Poor Butterfly (de Phillippi); Waltzes from A Waltz Dream (O. Straus); Violin Solo: Chanson bohémienne (Boldi); Selection from The Merry Widow (Lehár). **9.30,** Military Music. 1812 Overture (Tchaikovsky); Jolly Fellows (Vollstedt); Xylophone Solo: National Emblem March (Bagley); Berceuse (Lacôme); Praeludium (Jarnefeld); Amorettantanz (Gungl); March, Washington Post (Sousa). **10.0,** Dance Music. Signature Tune, The Bells of Normandy; A One-Horse Town; Pettin' in the Park; Elvira; The Gold Diggers' Song; My Lucky Day; For Love Time; For you, just you my Baby; Goofus; How could we be wrong; There's a Cabin in the Pines; Dawn in Montmartre; The Wedding of Mr. Mickey Mouse; It's the Talk of the Town; Tick, Tock; Oh! Johanna!; Shadows on the Swance; Signature Tune. **11.0,** Happy Hour. Part I: Orchestral Concert. Signature Tune: Ballet égyptien (Luigini); Love and Life in Vienna (Renard); Av, Av, Av (Freize); Selection from The Chocolate Soldier (O. Straus); Smilin' Through (Penn); You're the One; I Love to see the Evening Sun go Down; Lady of Spain; My Mom; Whistle. Part II: Organ Recital. Weymouth Chimes (Howgill); Serenade (Drigo); Roses of Picardy (Haydn Wood); Song: Tired Hands (Sanderson); The Temple Bells (Woodforde-Finden); Waltz and Selection (arr. Stoddon); Signature Tune. **12 Noon,** French Programme **2.0 to 7.30 p.m.,** Programme in English by the I.B.C. **2.0,** Concert. Persian March (Friml); Little Girl; Pianoforte Medley; College Humour (Coslow); Sizilietta (von Blon); Fairy Tale (Heykens); Violin Solo: Indian

Love Call, from Rose Marie (Friml); Pardon me, Pretty Baby; Waltz, Tales of the Vienna Woods (Joh. Strauss). **2.30,** Orchestral Concert. Waltz from The Gipsy Princess (Kálmán); Si petite (Claret); Violin Solo: The Pibroch (Goulesco); Liebesleid (Kreisler); Venetian Boatman's Song (Mantovani); Song: Lay your Head on my Shoulder (Conrad); La Paloma (Yradier); Selection from The Arabian Nights (Joh. Strauss). **3.0,** Gramophone Concert. Destiny Waltz (Baynes); Unrequited Love (Lincke); Wid de Moon, Moon (Cook); Shuffle off to Buffalo (Dubin); Pianoforte Solo: Balloons (Magine); Good-night, but not Goodbye (Roberts); The Song of the Rose (McCulloch); Veterans of Variety. **3.30,** Music by an Accordion Band. C'est vous (Künneke); Dinah (Lewis); Tango Serenade (Stolz); Accordion Joe (Wimbrow); Marietta (Charlier); Emilienne (Alexander); Signorina (Brown); The Valse of the Gigolo (Alexander). **4.0,** Light Orchestral Music. The Coon among the Chickens (Ives); Little Yvonne (Schwartz); Moonbeam (Peter); Lazy Pete (Werner). **4.15,** I.B.C. Nursery Corner. Birthday Greetings. **5.0,** I.B.C. Members' Request Half-hour. Swanee (Gershwin); Black Eyes (Ferraris); Father O'Flynn (Traditional); The Mill in the Forest (Eilenberg); Goodbye (Tosti); One Fine Day, from Madame Butterfly (Puccini); Tell me To-night (Eyton); The Grasshopper's Dance (Bucalossi). **5.30,** Orchestral Concert. Pas des Fleurs, from Naïla (Delibes); Anitra's Dance (Grieg); Harlequin's Serenade (Leoncavallo); Scherzo from A Midsummer Night's Dream (Mendelssohn). **5.45,** Concert. With you here and me Here (Eyton); Hebbie Hebbies (Atkins); Loisville Lady (Hill); Hold your Man (Freed). **6.0,** Concert. March, Light of Foot (Latann); A Little Idea of my own; Trouble in Paradise (Wever); Selection from The Pirates of Penzance (Sullivan); Widdecombe Fair (arr. Jacob); It's not a Secret any more (Blue); It's Sunday down in Caroline (Symes); The parade of the Tin Soldiers. **6.30,** Concert. Hiawatha's Lullaby; Mood Indigo; I cover the Waterfront (Heymann); Many Happy Returns (de Bear); Selection from White Horse Inn (Stolz-Benatzky); Nightfall; Heading for the Last Round Up (Hill); Fiddler Joe. **7.0,** Military Music. Old Panama (Alford); Valse des alouettes (Drigo); Bells of Somerset; Hobomoko (Reeves); Ballet Music from La Source (Delibes); Naval Patrol (Williams); Glow-Worm Idyll (Lincke); Valse Triste (Sibelius). **7.30,** French Programme. **9.0** till Close Down. Programme in English by the I.B.C. **9.0,** Dance Music. Signature Tune: Happy Feet; A Couple of Pals; A Couple of Fools in love; For Love Time; Throw open wide your Window, Dear; Smoke Rings; La Cumparsita; Trouble in Paradise; Experiment; Signature Tune: Happy Feet. **9.30,** Talkie Time: Tunes from the Talkies and Shows. Signature Tune: Sittin' in the Dark; Dance Pretty Lady (Strauss); Selection from This Week of Grace (Parr-Davies); Johnny (Hollander); Thanks (Coslow); A Girl like Nina (Abraham); Selection from Il est charmant (Moretti); Cuban Love Song (Fields); A Glass of Golden Bubbles (Strauss); Signature Tune. **10.0,** Orchestral Concert. Morning, Noon and Night (Suppé); Violin Solo: Moment musical (Schubert); El Relicario (Padilla); Kisses in the Dark (de Micheli); Humoresque (Dvorák); In the Valley of the Poppies (Ancliffe); Violin Solo: An Old Viennese Dance (Voglein); Gridiron Club March (Sousa). **10.30,** Dance Music. Dear Stranger; Love in the Moonlight; I only want one Girl; Symphony of the Breeze; Who's afraid of the Big Bad Wolf; The Three Trees; After you; The Cage in the Window; The Last round up. **11.0,** Light Music. Veleta Medley (Varney); Stephanie Gavotte (Czibulka); Your Song of Paradise; The Clater of the Clogs (Flynn); Banjo Quartet: Snatches of Song (arr. Grimshaw); The Ghost Walk; Ginger Snaps (Bourdon). **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd. Signature Tune: Come back to Erin; Fantasia on the Melodies of Johann Strauss; Woodland Peace (Favilla); Irish National March (Brase); Song: My Mother's Garden (Hanley); Play of Butterflies (Heykens); In far away Donegal (Alexander); I kiss your Lips (Rudolphe); March, La Czarine (Ganne); Signature Tune: Come back to Erin. **12.5 a.m. (Monday),** I.B.C. Late News Bulletin in English. **12.10** (approx.), I.B.C. Club Concert for Builth Listeners. Signature Tune: The Chum Song; Everyone loves my Marguerite (Woods); Sentimental Gentleman from Georgia (Perkins); Snowball (Carmichael); Mary Rose (Parr-Davies); Rocky Road (Gibbs); Morning, Noon and Night (Swanstrom); Don't blame me (Fields); My Moonlight Madonna (Fibich); Louisville Lady (Hill); 'Twixt the Devil and the Deep Blue Sea (Eyton); It's not a secret any more (Blue); I bring a Song (Young); With you here and me here (Eyton); Signature Tune. **1.0,** Gramophone Concert. Sweet Sue, just you (Young); Just an Echo in the Valley (Woods); You did everything for me (Connelly); Tony's Wife (Adamson); Song: Mountain Lovers (Squire); Marching through Georgia; Cornflowers and Poppies (Waldteufel); Selection from The Yeoman of the Guard (Sullivan). **1.30,** Music by a Hawaiian Band. Aloha Oe (Liliuokalani); Tomi Tomi (Traditional); Naughty Hawaii (Carlo); Honolulu Bay (Kahn); My Waikiki Mermaid (Traditional); Hula Hula; Cara Mia (Brodszky); Isle of Paradise (Earl). **2.0,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—10.30 a.m.,** See **Leipzig. 11.0,** See **Langenberg. 12 Noon,** See **Stuttgart. 12.15 p.m.,** Extracts from the Requiem (Verdi), by the Soloists, choir, and Orchestra of the Scala, Milan (on Gramophone Records). **1.20,** Talks arranged by the Wiesbaden Board of Agriculture. **1.30,** Rural Programme. **2.0,** See **Langenberg. 3.0,** See **Stuttgart. 5.0,** Reading from the Works of Ludwig Hebold. **5.25,** The Fate of Lieutenant Nolan—after the Dramatic Ballad by Heinrich Stilling. **5.45,** Talk: Remembrance Day. **6.15,** Gramophone Concert. **6.40,** Talk. **7.0,** See **Stuttgart. 7.15,** See **Berlin (Deutschlandsender). 8.10,** See **Stuttgart. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News and Weather. **9.40,** See **Langenberg. 11.0,** Serenade. **1.0 a.m. (Monday),** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—11.0 a.m.,** Choral and Orchestral Concert with Soloists. In the interval at **11.55,** Time and Weather. **1.0 p.m.** Snow White—Fairy Play for Children. **2.0,** Programme in commemoration of the Dead, with the collaboration of the String Quartet and Gerhard Gregor (Organ). **3.0,** See **Heilsberg. 4.50,** Talk: At the Graves of North German Writers. **5.15,** Requiem—Violin, Organ and Choral Recital in commemoration of the Dead. **6.20** (from **Hanover**), In memoriam—Programme by the Station Orchestra, conducted by Otto Ebel von Sosen, with Recitations and Commentary. **6.50,** Weather. **7.0,** Gevatter Tod—A Play (Eberhard König), with Incidental Music. **8.30,** Songs of Death (Joh. Seb. Bach) sung by Eva Schlee and Irmgard Etzdorf. **8.40,** Chaconne in D Minor (Bach-Busoni). **9.0,** Time and News. **9.30** Concert.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—10.30 a.m.,** See **Leipzig. 11.30 a.m.** (approx.), Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner. In the interval at **12 Noon,** Talk: The German War-Graves Commission. **1.30,** Talk on Chess. **2.0,** Violin, 'Cello, and Harp Recital. **2.30,** Programme by the Hitler Jugend. **3.0** (from **Danzig**), Concert conducted by Ernst Stieberitz. In the interval at **4.0,** Sports Notes. **5.0,** Stories and Legends for Remembrance Day, in North German Dialect. **5.30,** There is a Reaper—Choral Concert of Sacred and Secular Music. **6.0 to 6.15,** Interval. **6.15,** The Song of the Unknown Soldier (Ernst Schulz-Alexander). **6.45,** Sports Notes. **7.0,** Iphigenia in Aulis—Opera in Three Acts (Gluck). In the intervals at **7.40** and **8.55,** News. **9.25,** News and Sports Notes.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.—10.10 to 11.40 a.m.,** Programme of the Liberal Protestant Radio Society (V.P.R.O.).: Divine Service from a Church at Utrecht. **11.40 to 4.40 p.m.,** Programme of the General Broadcasting Society (A.V.R.O.). **11.40,** Time Signal. **11.41,** Talk: The Picture of the Week. **12.10 p.m.,** Concert of Light Music, conducted by Otto Hendriks. **1.40,** Weekly Book Talk. **2.10,** Concert by the Wireless Orchestra, conducted by Nico Gerharz. Soloist: Pierre Palla (Pianoforte). Symphonie Poem. Les Préludes (Liszt); Pianoforte Concerto in E flat (Liszt); Grand galop chromatique (Liszt); Gramophone Music: The New World Symphony (Dvorák). **3.55,** Gramophone Concert. **4.25,** Sports Notes and Gramophone Music. **4.40 to 7.40,** Programme of the Workers' Radio Society (V.A.R.A.). **4.40,** Programme for Children. **5.40,** Concert by the V.A.R.A. Orchestra, conducted by de Groot. **6.40,** Talk, followed by Gramophone Music. **7.10,** Concert of Light Music. **7.40** till Close Down. Programme of the A.V.R.O. **7.40,** Time and News. **7.55,** Concert of Light Music by Kovacs Lajos and his Orchestra. **8.40,** Song Recital by Tino Pattiera. **8.55,** Concert by the Wireless Orchestra, conducted by Albert van Raalte. Soloists: Eva Bandrowska (Soprano) and Tino Pattiera (Tenor). **9.25,** Song Recital by Alex de Haas. **9.45,** Concert (contd.). **10.25,** Gramophone Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.—8.10 to 9.10 a.m.,** Programme of the Christian Radio Society (N.C.R.V.). **8.10,** Divine Service. **9.10 to 4.40 p.m.,** Programme of the Catholic Radio Society (K.R.O.). **9.10,** Gramophone Music. **9.40,** Pontifical High Mass, relayed from The Dominican Church in Amsterdam. **11.40,** Concert by the K.R.O. Sextet. **12.40 p.m.,** Literary Talk. **1.0,** Sextet Concert (contd.). **1.40,** Religious Address. **2.10,** Concert by the Small K.R.O. Orchestra, conducted by van 't Woud. **2.40,** Talk: The Third International Missionary Congress. **3.10,** Gramophone Music. **3.40,** Concert (contd.). **4.10,** Programme for Invalids. **4.40 to 7.25,** N.C.R.V. Programme. **4.40,** Divine Service, relayed from a Church in Feyenoord. **7.10,** Sacred Music on Gramophone Records. **7.25** till Close Down, K.R.O. Programme. **7.25,** Football Results. **7.30,** Talk. **7.55,** Concert by the K.R.O. Orchestra, conducted by Gerritsen. Soloist: Renée Chemet (Violin). **8.40,** News. **8.45,** De geheime zender (The Secret Transmitter)—Radio Play (Mlle. Heyermans). **9.30,** Violin and Pianoforte Recital: German Dance (Mozart); Rondo in G (Mozart); Selection from La vida breve (Falla). **9.45,** Gramophone Records. **10.0,** Orchestral Concert (contd.): Selection from Fedora (Giordano); Extracts from Aïda (Verdi). **10.20,** Choral Epilogue. **10.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

NICE, 1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Sports Notes and Amusement Guide. **8.15,** Concert. **9.0** (in the interval), News. **10.0,** Request Half-hour. **10.30** till Close Down, Programme in English by the I.B.C. **10.30,** Military Band Concert: Old Comrades (Teike); Medley of British Songs (Krier); The Parade of the Tin Soldiers (Jessel); A Merry Hunting Day (Partridge); Wood Nymphs (Coates); El Abanico (Javaloyes); Gaiety Echoes. **11.0,** Variety Concert: Orchestra: The Wedding of the Rose (Jessel); Two Sketches: (a) Breakfast Time, (b) Midnight; Pianoforte and Organ Duet, Marigold (Mayerl); Song, The Song of Songs (Moya); Xylophone Solo, The Skaters' Waltz (Waldteufel); The Laughing Sousaphone (Grey); Orchestra: Jollity on the Mountains (Fetras). **11.30,** Light Orchestral Concert: Lazy Pete (Kernsten); Serenade (Schubert); Selection from Mother of Pearl (arr. Finck); Wedding Waltz (Lincke); Hungarian Melodies (Korbay); Dreams of the Ocean (Gungl); Irish Washerwoman (arr. Soerby); Musical Comedy Switch (arr. Hall). **12 Midnight,** Dance Music: Hold Me; Waltzing in a Dream; Isn't it Romantic; Standing on the Corner; One little Word led to another; In the Valley of the Moon: Moon Song; Maybe I love you too much; The Old Spinning Wheel; I can't remember; Love will find a way; How do you do, Mr. Brown? My Darling; Sittin' in the Dark; My Heart's to let; Pickaninnies' Heaven. **1.0 a.m. (Monday),** I.B.C. Goodnight Melody and Close Down.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**10.0 a.m.,** Symphony in B Flat (Bruckner), by the Station Orchestra, conducted by Buschkötter. **11.0,** Gramophone Concert of Organ and Choral Music. In the interval, Totentanz (Dance of Death)—A Cycle of German Ballads. **12 Noon,** See **Stuttgart. 12.15 p.m.,** Vocal and Instrumental Concert. **1.15 to 1.30,** Agricultural Programme. **1.40,** Talk for Parents and Children: Wise Presents. **2.0,** Fairy Tales for Children. **3.0,** See **Heilsberg. 5.0,** Reading from the Letters of Johann Sebastian Bach. **5.15,** The Clock Symphony in D, No. 4 (Haydn), on Gramophone Records. **5.45,** Bunte Stunde, with Talk by Dr. Förster, Curator of the Wallraf-Richartz Museum, Cologne. **6.45,** Sports Notes. **7.0,** See **Stuttgart. 7.10,** See **Berlin (Deutschlandsender). 8.10,** See **Stuttgart. 9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News, Weather and Sports Notes. **9.40,** Light Music. **10.0,** Concert by the Station Orchestra, conducted by Buschkötter. **11.0,** See **Frankfurt. 1.0 a.m. (Monday,** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—10.30 a.m.,** Ich hatte viel Bekümmernis—Cantata (Bach), by the Municipal and Gewandhaus Orchestra, the Choir of St. Thomas' and Soloists. **11.0,** Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber. Soloist: Alfred Jelmlich (Viola). **1.0 p.m.,** Weather and Time. **1.5,** Programme Announcements. **1.25,** Agricultural Notes. **1.35,** Children and Animals before the Microphone. **2.10,** Recital by Dorothea Braus. **3.0,** Concert by the Dresden Philharmonic Orchestra, relayed from the Dresden Radio Exhibition. **4.0,** Announcements of Solutions and Awards in the Competition: Do you know your own Country? **4.15,** Talk: Naumburg Cathedral. **4.45,** Letters of Men who Fell in the Great War. **5.0,** Organ Recital. **5.35,** Mozart's Last Days— Radio Play, arranged from Karl Söhle's Play by Dr. Amadeus Grohmann. **6.50,** A Sacred Dialogue for Contralto, Mixed Choir and Four Clarinets (Helmuth Meyer). **7.35,** Concert by the Leipzig Symphony Orchestra, conducted by Hans Weisbach. **9.0,** News and Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—**12 Noon,** Concert by the Radio Orchestra, conducted by Henri Pensis. **1.0 p.m.,** Gramophone Music. **7.0** till Close Down, English Evening. **7.0,** Symphony Music on Gramophone Records: Petroushka (Stravinsky); The Planets (Holst). **8.0,** Suite, Scenes of Alsace (Granville Bantock); In the Mystic Land of Egypt (Ketelbey); Dreaming (Haydn-Wood); The Caress (Byford). **8.50,** News in French. **9.0,** Pianoforte Recital by Madeleine Beicht: Toccata and Fugue in D minor (Bach-Tausig); Ballad in G minor (Chopin); Etude en forme de valse (Saint-Saëns). **9.30,** Concert by the Radio Orchestra, conducted by Henri Pensis: Waltz, Gold and Silver (Lehar); Baby plays Soldiers (Micheli); Hungarian Rhapsody No. 2 (Liszt). **9.50,** News in German. **10.0,** Gramophone Music: Stephen Foster Melodies; Songs from The Chocolate Soldier (O. Straus); My Blue Heaven (Whiting and Donaldson). **10.15,** Dance Music.

MADRID

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Programme relayed from **Madrid (EAJ7). 12 Midnight** till Close Down, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Signature Tune, Come Back to Erin; Yes, Mr. Brown (Abraham); Arrogancia Andaluza (Bruguera); A Song, a Kiss, a Girl (Gilbert); On a Little Street in Honolulu (Sherman); Blues I love to Sing (Ellington); A Penny for Your Thoughts (Cuevas); Kissing is no sin (Eysler); The Love Lieutenant (Gilbert); Signature Tune, Come Back to Erin. **12.30 a.m. (Monday),** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**8.0 to 9.0 a.m.,** Topical Review. **11.30,** Municipal Band Concert, relayed from the Retiro. **2.0 p.m.,** Chimes, Time, Theatre Notes, and Popular Music. **4.0 to 7.0,** Interval. **7.0,** Chimes, Announcements, and Dance Music. **8.30 to 9.30,** Interval. **9.30,** Chimes and Time. **9.35** (approx.), Pianoforte Recital by Enriqueta Garreta, followed by Song Recital by Palmiro Matamoros del Val (Tenor), in connection with the Music Competition. In the interval, Talk by Gomez de la Serna. **12 Midnight,** Chimes. **1.0 a.m. (Monday)** till Close Down, I.B.C. Programme of Dance Music: It's Sunday down in Caroline; We belong together; My Gipsy Rhapsody; There's Magic in the Air; Headin' for a Weddin'; Don't blame me; Stay out of my Dreams; Hurricane Harry; What did I do to be so Black and Blue? It's time to sing sweet Adeline again; With you here and me here; You're charming; Sweet Savannah Sue; Swanee; Let's try again; Stay on the Right side of the Road. **2.0,** I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**11.15 a.m.,** Concert by the Station Orchestra, conducted by Plichta. **12.30 to 12.55,** See **Prague. 3.0,** See **Brno. 4.30,** See **Prague. 7.20,** Dance Music by the Station Orchestra. **8.0,** See **Prague. 10.0** (approx.), Close Down.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsberg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.—10.30 a.m.,** See **Leipzig. 11.0,** Concert from the Feldherrnhalle. **12 Noon,** Time, Weather and Programme Announcements. **12.10 p.m.,** Talk: The German Peasant and his Ancestry. **12.30,** Gramophone Concert of Popular Music. **1.0** (from **Nürnberg**), Advanced Chess Lesson. **1.30,** Radio Report from the Dagling Race Course. **2.0,** Zither Recital. **2.30,** Programme for Children. **3.0,** Concert by the Small Station Orchestra, conducted by Karl List. **4.25,** Tales and Songs of the Bavarian Forests and the Egerland, by the Station Chamber Choir, and Soloists. **4.45,** Pianoforte Sonata in C—the Waldstein (Beethoven). **5.5,** Talk: In a Motor through the

NOV. 26th SUNDAY *continued*

Desert. 5.30, Wind Instrument Concert, relayed from **London.** 6.30, Reading: A Terrifying Journey in a Balloon. 6.50, Weather and Sports Notes. 7.5, Concert by the Station Orchestra, conducted by Hans Winter. Soloists: Willy Stuhlkauth and Adolf Bruno Winkler (Violin), and Richard Staab (Pianoforte): Overture, Jessonda (Spohr). 9.0, Time, Weather and News. 10.0, See **Langenberg.**

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres;** and **Rjukan, 671 kc/s, 447.1 metres; and Jelöy, LCL, 6,990 kc/s, 42.92 metres.**—9.15 **a.m.,** News and Weather. 9.20, Chimes 9.30, Divine Service Relay. 12 **Noon** (from **Fredriksstad**), Orchestral Concert. 4.0, **p.m.,** Gramophone Concert. 4.45, Talk. 5.15, Recital of Künnecke Operetta Music arranged for Two Pianofortes. 5.45, Literary Review. 6.15, Weather and News. 6.30, Pianoforte Recital by Waldemar Alme. Five Pieces (Chopin). 7.0, Time Signal. 7.1, Recitations. 7.30, Concert by the Station Orchestra, conducted by Kramm. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Old Dance Music. 9.45, Dance Music on Gramophone Records. 11.0 (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**9.25 a.m.,** Bible Reading. 9.40, Sacred Music. 11.5, Agricultural Talk. 11.45, Giornale Radio. 12 **Noon** till 1.0 **p.m.,** Jazz Music. In an interval at 12.30, Time, Announcements and Weather. 4.30 **to** 5.30, Gramophone Music. 7.0, Dopolavoro Notes and Giornale Radio. 7.20, Sports Notes. 7.30, Time and Announcements. 7.45, Concert of Opera Music conducted by Fortunio Russo. In the interval, Talk and Announcements. 10.0, Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres)** at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**12.30 p.m.,** Concert by the Jean Ibos Orchestra. 1.0, News and Press Review. 1.15, Concert (contd.). 3.15 (approx.), Concert Relay. 5.45, Le Journal Parlé. 7.15, Weather and News. 7.30, Gramophone Concert. 9.0 (approx), Close Down.

PARIS

POSTE PARISIEN; 914 kc/s, 328.2 metres 60 kW.—**10.0 a.m.,** Gramophone Music. 10.5, Recitations. 10.10, Press Review. 10.30, Gramophone Records. 11.0, Gramophone Music. 11.30, Sponsored Concert. 12 **Noon,** Gramophone Music. 12.15 **p.m.,** Sponsored Concert of Music from Sound Films. 12.45, Sponsored Programme. 12.50, Half an Hour of Fantasy, by Paul Weil. 1.30, Sponsored Gramophone Concert. 2.0, Interval. 7.0, Le Journal Parlé. 7.5, Gramophone Records of Paderevsky. 7.20, Sports Notes. 7.30, Catholic Review. 8.0, Gramophone Records of Chaliapine. 8.30, La morale d'Esculane—One-Act Play (Henri Français). 9.0, Interval. 9.20, Guessing Competition: Who is it? 9.35, Concert. 10.30, News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**7.45 a.m.** Gramophone Records. Selection from Le Million (Moretti); Donne-moi ton coeur (Rosen); Margaritas (Penaloza; and Miss Columbia (Mareeau). 8.0 Press Review and Weather. 8.30, Gymnastics. 9.20, Advanced English Lesson. 9.40, Elementary English Lesson. 10.0, Elementary Book-keeping Lessons. 10.40, Spanish Lesson. 12 **Noon,** Religious Address. 12.20 **p.m.,** Sacred Music. Fugue in E minor (Bach); Ave Maria (Arcadelt); Allegro Molto from Sonata No. 6 (Mendelssohn). 12.30, Gramophone Concert. Selection from The Nuremberg Doll (Adam); España (Chabrier); La boîte à joujoux (Debussy); El fandago de Candil (Duran); Invitation to the Waltz (Weber); Alleluia d'amour (Fauré); Cortège from The Queen of Sheba (Gounod) 1.30 **to** 2.30, Programme in English by the I.B.C. 1.30, Gramophone Concert. Marche de bravoure (Schubert); Birds of the Forest (Messier); Black Rose (Aubry); Si vous n'étiez pas aussi jolie (Silvanio); Tu sais (Erdvante); Waltz, The Sirens (Waldteufel); Gipsy Serenade (Borganov; Lacartarena (Guerrero). 2.0, Concert of Dance Music. Signature Tune, Happy Feet; Let's all be happy Together; Everybody loves my Marguerite; Spanish Eyes; I like to go back in the Evening; Who's afraid of the Big Bad Wolf; Destiny Waltz; That's what Life is made of; Throw open wide your Window; Signature Tune, Happy Feet. 2.30, Interval. 3.0 **to** 3.30, Programme in English by the I.B.C. 3.0, Concert. Signature Tune, Night shall be filled with Music; It's never too Late; The Last Round up (Hill); Hold your Man (Freed); Dinner at Eight (Fields); La mulata rumbera; Experiment (Porter); H'ya Duchess; The Day you came along; Signature Tune. 3.30, Concert of Light Music. 4.0, **to** 4.15, Programme in English by the I.B.C., Gramophone Concert. Sérénade Tzigane (Borganov); If you're really and truly in Love (Butler); Manola (Liberad); Just a Little closer (Johnson). 4.15, Interval. 5.0, Popular Concert. 7.0, Concert of Light Music. 8.0, Music Hall. In the intervals at 8.30, Sports Notes and Weather, and at 9.15, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW.—Relayed by **W8XK** on **48.86 metres,** and **25.27 metres.**—5.30 **to** 6.30 **p.m.,** Radio City Concert, from **New York.** 7.0, Bar X Ranch, from **New York.** 7.30, Programme to be announced. 8.0 **to** 9.30, **New York** Relay. 8.0, International Tid-bits. 8.30, Variety Programme. 9.0, True Railroad Stories. 9.15, Morin Sisters. 9.30, Vesper Services. 10.30, Grand Hotel, from **New York.** 11.0, Press News-Reeler. 11.15, Weather and Sports. 11.30, Happy Felton's Orchestra. 11.45 **to** 2.45 **a.m. (Monday), New York** Relay. 11.45, True Engineering Stories. 12 **Midnight,** Vincent Lopez Orchestra. 12.30, Joe Penner. 1.0, Egon Petri and Orchestra. 2.0, Gulf Headliners. 2.30, Walter Winchell. 2.45, Marvellous Melodies. 3.0, Orchestral Concert, from **New York.**

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**10.0 a.m.,** Concert by the Ondricek String Quartet. 11.0, Chimes. 11.5, News. 11.15, See **Moravska-Ostrava.** 12.30 **p.m.,** Agricultural Programme. 12.45, Talk. 12.55, Interval. 3.0, See **Brno.** 4.30, Reminiscences of Life and the Theatre by a Blind Actor. 4.45, Gramophone Music. 5.0, German Transmission: Music Programme Announcements, a Revue and News. 6.0, News. 6.5, Talk. 6.20, Introductory Talk to the following Transmission. 6.30, Act I of Dogheads—Opera (Kovarovics), relayed from the State Opera House. Conductor: Otalear Ostreil. 7.20, See **Brno.** 8.0, Time Signal. 8.1, Concert by the Station Orchestra, conducted by Jeremias. Soloist: Daniel (Violin). 9.0, Time, News, and Sports Notes. 9.20, Concert by the Herman Schrammel Ensemble. 10.0 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW., and **Geneva, 400 kc/s, 749.9 metres.**—**8.55 a.m.** (from **Geneva**), Chimes. 9.0 (from **Geneva**), Protestant Serviee, relayed from St. Peter's Cathedral. 10.0 (from **Geneva**), Gramophone Concert. 11.30, News and Weather. 11.40 (from **Geneva**), Gramophone Concert (contd.). 1.0 **p.m.,** Interval. 2.30, See **Schweizerischer Landessender.** 4.30, Interval. 5.0 (from **Geneva**), Gramophone Concert. 6.0 (from **Geneva**), Catholic Address. 6.30 (from **Geneva**), Radio Chronicle and Sports Notes. 7.0 (from **Geneva**), Messa domestica for Orchestra, Soprano and Organ (Grechaninov), with Introductory Talk. 7.35 (from **Geneva**), Humorous Programme. 7.55 (from **Geneva**), Concert by the Radio Suisse romande Orchestra, conducted by Echenard. Part I—Romanian Music. Rustic Divertissement (Dragoi). Part II—Suite cévenole (Lauber). 9.0, News and Weather.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan, Vigentino, 662 kc/s, 453.1 metres;** from 7.45 **p.m.;** and **2RO, 11,810 kc/s, 25.4 metres.**—9.0 **a.m.,** News, Sports Notes and Amusement Guide. 9.30, Agricultural Talk. 9.45, Bible Reading. 10.0 **to** 11.0, See **Turin.** 11.30, Gramophone Music. 11.45 **to** 1.15 **p.m.,** See **Turin.** In the interval at 1.0, Time and Announcements. 3.0 **(Naples),** Programme for Children Weather and Sports Notes. 3.15, Gramophone Music and Sports Report. 4.0, Symphony Concert conducted by Bernardino Molinari, relayed from the Augusteo: Soloist, Attilio Brugnoli (Pianoforte): Football Report in the interval. 5.30 **to** 5.35 (approx.), Weather. 6.30, Sports Notes, Dopolavoro Report and News. 7.0, Time and Announeements. 7.30, Sports Notes. 7.45, Addio giovinezza. Operetta in Three Acts (Pietri). In the intervals Talk and Announcements. Giornale Radio after the Operetta.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD,** on **19.56 metres.**—7.0 **to** 9.0 **p.m.** (approx.). **New York** Relay. 7.0, Gene Arnold and Commodores. 7.30, Looking over the Week, by John Kennedy. 7.45, Gems of Melody. 8.0, Wayne King's Orchestra. 8.30, Musical Programme. 9.0 (approx.) **to** 12.45 **a.m. (Monday),** Interval. 12.45 **to** 3.45 **a.m., New York** Relay. 12.45,

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NOV. 26th SUNDAY *continued*

Popular Programme with Wendell Hall. **1.0,** Variety Programme. **2.0,** Manhattan Merry Go Round. **2.30,** American Album of Familiar Music. **3.0,** Variety Programme. **3.30,** Popular Programme. **3.45,** Seth Parl, from **New York,** followed by Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—9.0 a.m.** (from **Zürich**). Catholic Service. **9.35** (from **Zürich**). Swiss Army Festival Programme, relayed from the Town Hall. **10.30** (approx.) (from **Zürich**), Talk. **11.0** (from **Zürich**). Gramophone Concert. **11.30,** Time, News and Weather. **11.40** (from **Zürich**). Concert by the Station Orchestra. **12.30 p.m.** (from **Zürich**). Concert conducted by Meyer. **1.0** (from **Zürich**). Talk. **1.30,** Interval. **2.30,** Concert by the Harmonie Male Voice Choir, relayed from the Town Hall, St. Gall. **4.30** (from **Zürich**). Talk in a Foreign Language. **5.0** (from **Zürich**). Gramophone Concert. **5.30** (from **Zürich**). Jacob Bührer reads from his Drama, Galileo Galilei. **6.0** (from **Zürich**). Sports Results. **6.5** (from **Zürich**). Gramophone Concert. **6.20** (from **Zürich**). Talk: Technical Progress. **6.50** (from **Zürich**). Venus—Opera in Three Acts (Schoeck), relayed from the Municipal Theatre. **9.30** (approx.). Sports Report and Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW.—Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.—8.0 a.m.,** Rural Programme. **8.30,** Gramophone Music. **9.10,** Talk for Workers. **9.30,** Talk for Workers, relayed from **Uppsala, 662 kc/s, 453.1 metres. 10.0,** Divine Service. **11.45,** Weather and Ice Report. **1.0 p.m.,** Recital by Ann-Marie Florin (Songs), and Torval Hagelin (Pianoforte), relayed from **Falun, 977 kc/s, 307 metres. 1.30,** Talk. **2.0,** Songs to the Lute by Eric Möllestedt. **2.20,** Gramophone Music. **3.0,** Elementary English Lesson. **3.30,** Programme for Children. **4.5,** Schubert Pianoforte Duets, by Stig Ribbing and Axel Pettersson. **4.30,** Reading. **5.0,** Evensong, relayed from a Church in Hudiksvall. **6.15,** Weather and News. **6.30,** Talk, relayed from a Cripples' Home. **6.45,** Concert by the Radio Orchestra, conducted by Tor Mann. Soloist: Mauritz van den Berg (Violin). **8.0,** Salvation—Radio Play (Martinson). **8.45,** Weather and News. **9.0,** Light Orchestral Music. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**9.30 a.m.,** Orchestral Concert, conducted by Maurice de Villars. **10.45,** Protestant Service. **11.30,** Catholic Service in German. **12 Noon,** Gramophone Concert. **12.45 p.m.,** News. **1.0,** Time Signal. **1.1,** Gramophone Concert. **2.0,** Talk in French on Arboriculture. **2.15,** Interval. **3.0,** Concert by the Conservatoire Concert Society, relayed from the Conservatoire. **5.0,** Organ and Choral Music, relayed from the Catholic Church of St. Pierre-le-vieux. The Parish Choir, conducted by Welker. Soloist: Fernand Rich (Organist). **6.0,** Medical Talk in French: Innoculation against Diphtheria. **6.15,** Sports Talk in French. **6.30,** Orchestral Concert, conducted by Maurice de Villars: Marche militaire (Schubert); Dance of the Waves (Catalani); Overture, The Black Domino (Auber); Selection from The Tales of Hoffmann (Offenbach); Two Arabesques (Debussy); Orchestral Suite from Der Rosenkavalier (R. Strauss). **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German and Lottery Results. **8.30,** Wine—An Alsatian Programme of Songs, Readings and Anecdotes with Bandonian Music. **10.30,** Press Review in French, followed by Dance Music from the Savoy. **12 Midnight,** Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.—10.30 a.m.,** See **Leipzig. 11.0,** Gramophone Concert of Popular Music. **12 Noon,** Topical Talk. **12.15 p.m.,** See **Langenberg. 1.15,** Agricultural Talk. **1.30,** Talk: Music, Men and Animals. **2.0,** See **Langenberg. 3.0,** See **Heilsberg. 5.0.** Recital of Beethoven Music by Artur Haagan and on Gramophone Records. **5.50,** Sports Notes. **6.15,** November, the Month of Fogs (arr. Martin Lang). **7.0,** Organ Recital by Fritz Hayn, relayed from the Cathedral, Ulm. **7.30** (approx.). See **Berlin (Deutschlandsender). 8.10,** Concert by the Station Orchestra, conducted by Ferdinand Drost. Soloist: Hans Hermann Nissen (Baritone). **9.0,** See **Frankfurt. 9.20,** Topical Talk. **9.30,** Local News, Weather and Sports Notes. **9.40 to 11.0,** See **Langenberg. 11.0,** See **Frankfurt. 1.0 a.m. (Monday),** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**11.45 a.m.,** Music from Sound Films. **12 Noon,** Accordion Solos. **12.15 p.m.,** Orchestral Music. **12.30,** Catholic Service. **12.45,** Songs. **1.0,** Amusement Guide, Exchange, and Time. **1.5,** Opera Music. **1.15,** Operetta Music. **1.30,** Orchestral Music. **1.45,** Protestant Service. **2.0,** Chansonnettes. **2.15,** Agricultural Report. **2.30,** Music by a Viennese Orchestra. **2.45,** Opera Music. **3.0,** Organ Recital. **3.30,** Music from Sound Films. **3.45,** Orchestral Concert. **4.15,** Opera Music. **4.30,** Music by an Argentine Band. **4.45,** Light Music. **5.0,** Thé dansant. **5.45,** Songs. **6.0,** News. **6.15,** Military Music: Fire and Steel (Rathke). **6.30,** Russian Songs and Balalaika Music. **6.45,** Chamber Music. **7.0,** Accordion Solos. **7.15,** News. **7.30,** Polotsian Dances from Prince Igor (Borodin), by the Station Orchestra. **7.45,** Chansonnettes. **8.0,** Concert by a Viennese Orchestra. **8.30,** Opera Music. **8.45,** Hawaiian Guitar Solos. **9.0,** Orchestral Music. **9.15,** Manon—Opera in Five Acts (Massenet). In the interval at **10.15,** News. **11.30,** Military Music. **11.45,** Music from Sound Films. **12 Midnight,** News, Weather, and Announcements. **12.5 a.m. (Monday),** Music by an Argentine Band. **12.15,** Orchestral Music. **12.30** (approx.). Close Down.

TRIESTE

1,221 kc/s, 247.7 metres; 10 kW. **8.40 a.m.,** See **Turin. 8.55,** Mass from the Cathedral of San Giusto. **10.0,** Religious Address. **10.20,** Agricultural Talk. **11.0** till Close Down. See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—8.40 to 8.55 a.m.,** Giornale Radio. **9.40,** Agricultural Notes. **10.0,** Mass from the Church of the Annunciation, Florence. **11.10 to 11.15,** Bible Reading. **11.30,** Gramophone Music. **11.45,** Gramophone Music. **12 Noon,** Time and Announcements. **12.2 to 1.15 p.m.,** Concert of Variety Music. **3.0,** Gramophone Music and Sports Notes. **4.0,** Concert of Variety Music. Football Report in the interval. **5.0** (approx.). Sports Review of the Day, followed by Weather. **6.0,** Time, Football Report, Dopolavoro Announcements and Gramophone Music. **6.15,** Gramophone Records of Light Music. **7.0,** Announcements, Sports Notes and Gramophone Music. **8.0,** An Opera (to be announced). Talk, Theatre Notes and Giornale Radio in the intervals.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Herbert Winkler. Soloist: Toni Sommer-Wirtinger (Pianoforte). **1.0 to 1.35 p.m.,** Interval. **1.35,** Time, Announcements, and News. **1.45,** Talk: The Work of the Forester. **2.5,** Review of Books. **2.30,** Chamber Music by the Philharmonic String Quartet. **3.30,** An Entertainment. **3.55,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. **5.5,** Talk, with Gramophone Illustrations: Wisdom and Humour in African Literature. **5.35,** Josefine Widmar reads from her own Works. **6.0,** Violin and 'Cello Recital. **6.50,** Time, Sports Notes, and Programme Announcements. **7.0,** Pension Schöller—Farce in Three Acts (Jacoby and Carl Laufs). **8.45,** News. **9.0,** Concert by the Wiener Symphoniker, conducted by Holzer.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**9.0 a.m.,** Speeches by Delegates to the Fifth Congress of the Organisation of Poles Abroad, relayed from the Senate. **10.35,** Talk: The Jesuit Fathers in Rhodesia. **10.57,** Time and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5,** Programme Announcements. **11.10,** Weather. **11.15,** Concert by the Philharmonic Orchestra, conducted by Armand Balendonck. Soloist: Jeanne Hupert (Mezzo-Soprano). In the interval at **12.30 p.m.,** Talk: The Industrialisation of Poland. **1.0,** Talk: Polish Forests. **1.15,** Agricultural Market Prices. **1.25,** Concert by the Cathedral Male Voice Choir. **2.0,** Talk: Winter Evenings in the Country. **2.20,** Concert by the Squire Quintet, on Gramophone Records. **3.0,** Programme for Children. **3.30,** Gramophone Records of Yehudi Menuhin. **3.45,** Talk on Books. **4.0,** Talk for Women. **4.15,** Programme, relayed from **Cracow, 959 kc/s, 312.8 metres.** In the interval, Announcements. **5.0,** Dramatic Programme. **5.40,** Song Recital by Irene Downer-Zapolska (Soprano). **6.0,** Programme Announcements. **6.5,** Miscellaneous Items. **6.30,** Weekly Topical Talk. **6.45,** Talk on Art. **6.50,** Variety Programme, relayed from **Lwow, 788 kc/s, 381 metres. 7.35,** Radio Journal. **7.45,** New York Baby—Musical Comedy in Five Scenes (Fanny Gordon-Eiger).

ZURICH.—See **Schweizerischer Landessender.**

MONDAY
NOVEMBER THE TWENTY-SEVENTH

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 22.4 metres.**—**1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gaelic Talk. **7.15,** Talk: Our Mineral Sources of Wealth. **7.30,** Time Signal. **7.31,** Concert by the Station Orchestra. **8.0,** Variety Programme by Tom Madden and Company. **8.30,** Pianoforte Solos by Victor Love. **8.45,** Baritone Solos by Richard Browne. **9.0,** The Station Orchestra. **9.15,** Soprano Solos by Mm. K. McCaffery. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert: A Supper with Suppé (arr. Morena); Intermezzo, Liebesfreud (Kreisler); Song, The Gay Highway (Lockton); Hungarian Dance No. 1 in G Minor (Brahms). **9.45,** Concert of Dance Music: I've got to sing a Torch Song; It's within your Power; My Moonlight Madonna; The Grass is getting greener all the Time. **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Dance Music, Lazybones; Waltzing alone with you; Remember my forgotten Man; Racing Commentary; Homemade Heaven; Isn't it Heavenly?; Reflections in the Water; Old Timers. **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** Traditional Fiddle Solos by May Kavanagh. **10.50,** Uilleann Pipe Solos, by S. MacAonghusa. **11.0** (approx), Close Down

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Trio No. 1 (Couperin); Slav Caprice (Bayer); Canzonetta (Toselli); Les Cloches (Debussy); Waltz-Scherzo (Liadov); Der Erlkönig (Schubert). **7.0,** Request Gramophone Music. **7.20,** Sports Notes. **7.30,** Exchange and Talk in Catalan. **8.0,** Gramophone Music and News. **8.30,** Educational Programme: Geography and History Lesson. **9.0,** Chimes, Weather, Exchange, and Market Prices. **9.5,** Humorous Review of the Week in Verse. **9.15,** Concert of Sardanas. **10.0,** Concert by the Radio Orchestra. **11.0,** News and Dance Music from the Casa Llibre. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Gramophone Music. **3.55** (approx.) **to 7.0,** See **Rome. 7.0 to 7.15,** News in Albanian. **7.30** (approx.) till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**6.0 p.m.,** Popular Music on Gramophone Records. **6.30,** Violin Recital by Vladimir Slatin. **7.0,** Talk. **7.30,** Manon, Opera (Massenet), on Gramophone Records. In the interval at **9.0,** Time and News.

BERLIN

DEUTSCHLANDSENDER (REICHSSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—**11.5 a.m.** (approx.), Gramophone Concert of Opera Music: Overture, Il Seraglio (Mozart); Aria from The Magic Flute (Mozart); Overture, The Barber of Bagdad (Cornelius); Duet from The Barber of Seville (Rosini); Aria from Czar and Carpenter (Lortzing); Overture to and Aria from The Merry Wives of Windsor (Nicolai); Selection from Der Wildschütz (Lortzing); Dance of the Apprentices from The Mastersingers (Wagner); Overture, The Bartered Bride (Smetana); Aria and Waltz from Hansel and Gretel (Humperdinck). **11.55,** Time Signal. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Gramophone Concert: Mephisto-Walzer (Liszt); Movement from the Fantastic Symphony (Berlioz); Das Hexenlied (Max von Schillings); L'apprenti sorcier (Dukas); Dance from Pictures from an Exhibition (Mussorgsky). **2.0, Talk for Women. 2.30,** Weather and Exchange. **2.45,** Review of Books. **3.0,** See **Breslau. 4.0,** Discussion: The Vocational Training of Young People. **4.25,** Tag und Nacht, String Quartet Op. 2 (Rudolf Peterka). **5.0,** Poems. **5.5,** Talk on Sport. **5.20,** Talk: The Motor Mechanic. **5.30,** Talk: The Problem of Land and House Buying. **5.50,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Stuttgart. 7.0, See Berlin (Funkstunde). 7.5,** Learning to Ski-run. **7.20,** Talk on Tchaikovsky, on the fortieth anniversary of his Death. **7.30,** Concert by the Augmented Station Orchestra, conducted by Edwin Lindner: Soloist, Gaspar Cassado ('Cello); Romeo and Juliet (Tchaikovsky); 'Cello Concerto in B Minor (Dvorak); Carniva (Scherber). **9.0,** News. **9.30,** Talk. **9.45,** Weather. **10.0,** See **Munich.**

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.**—**3.0 p.m.,** Seven Variations for 'Cello and Pianoforte on a Melody from Mozart's The Magic Flute (Beethoven), played by Casals and Cortot, on Gramophone Records. **3.15,** Talk: A Visit to Burg Saaleck. **3.30,** Thé Dansant from the Hotel Esplanade. **4.50,** Talk on Schmidt von Werneuchen. **5.10,** Variations and Fugue for Pianoforte on a Theme of Telemann (Reger). **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Stuttgart. 7.0,** Radio Report from the Christmas Tree Decoration Industry in the Thuringian Forest. **7.5,** Contemporary Chamber Music by the Kampfbund Quartet: String Quartet in A Minor, Op. 6 (Helmut Schaefer): First String Quartet (Kurt Fiebig). **8.0 to 9.0,** See **Hamburg. 9.0,** News. **9.20** (approx.) till Close Down. Programme from **Hamburg. 11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**5.25 p.m.,** Symphony No. 1 in C, Op. 21 (Beethoven), by the Station Orchestra, conducted by Dyk. **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.10,** See **Brno. 6.25,** Gramophone Music. **6.40,** See **Prague. 6.55,** Concert of Light Music by the Station Orchestra. **7.20,** Uncle Matthew—a Folk Play in Three Acts, with Songs (Urbanek), for the Author's Seventy-Fifth Birthday. **9.0,** See **Prague. 9.15** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.**—**10.55 a.m.** (approx.), Concert by the Station Orchestra, conducted by Ernst Topitz. In the interval from **12.45 to 1.10 p.m.,** Time and News. **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Market Prices. **2.20** (from **Gleiwitz**), Talk: Traces of the Ice Age in Upper Silesia. **2.40,** Review of Books on Luther. **3.0,** Concert by the Andreozzi Orchestra, relayed from the Vier Jahreszeiten Café. **4.50,** Agricultural Notes. **4.55,** Talk: Genealogy. **5.10,** Technical Talk. **5.20,** Topical Talk. **5.40,** Programme Announcements and Meat Market Prices. **6.0,** Transmission for all German Stations, relayed from **Stuttgart. 7.0,** News. **7.10,** Symphony Concert by the Silesian Philharmonic Orchestra. Part I, conducted by Joachim Albrecht, Prince of Prussia. Festival Overture (Prince Joachim Albrecht of Prussia); Prince Louis Ferdinand Fantasia (Prince Joachim Albrecht of Prussia); German Fantasia (Prince Joachim Albrecht of Prussia). Part II, conducted by Franz von Hoesslin: Symphony in D, No. 38 (Mozart). **9.0,** See **Munich. 9.20,** Time and News. **9.50,** Serenade on Gramophone Records. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News, Recitations and a Report on Brno Exhibitions. **6.0,** See **Prague. 6.10,** Talk. **6.25,** Song Recital. **6.40,** See **Prague. 6.55,** Organ Recital by Jiri Reinberger, relayed from the Stadium: Prelude and Fugue in D (Bach); Concerto in E (Handel). **7.25** till Close Down, See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Music: Selection from Don Pasquale (Donizetti); Ballet Music from Les aventures du roi Pausole (Honegger): Overture, Light Cavalry (Suppé). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Pierre Leemans. **2.0,** Broadcast for Schools. **5.0,** Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans: Overture, Aenéis (Uyttenhove): Two Elegiac Melodies (Grieg); Song and Scherzo for Wind Instruments (Florent Schmitt); Fantasia on Two Angevin Airs (Lekeu); Fantasia on a Walloon Christmas Carol (Ysaye); Marche héroïque (Saint-Saëns). **6.0,** Talk: Oliver Cromwell. **6.15,** Gramophone Music: Two Arias from Werther (Massenet); Duet from Act 1 of Faust (Gounod). **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Cortège, Louis XIII (Fauchey); Impressions rustiques (Razigade); Cantilène (Van Goens); Danse caractéristique (Saeys); Selection from La dame verte (Ferrarese); La romanesca from La Vannina (Bastide); Petite Suite No. 2 (Gilson); Idylle slave (Ackermans); Old Songs (Broustet). **7.30,** Theatre and Film Review. **8.0,** Concert by the Radio Orchestra, conducted by Walpot: Marche militaire française (Saint-Saëns); Overture, Le roi d'Ys (Lalo); Extase (Ganne); Selection from Le petit duc (Lecoq). **8.30,** L'appel des ailes—Radio Play (Jacques Prieux). **9.10,** Noces d'or—Musical play (Maurage); The Radio Orchestra, conducted by Charles Walpot; Soloists, Suzanne de Gavre (Soprano), Armand Crabbé (Baritone), and Hellinckx (Bass-Baritone). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc s, 337.8 metres; 15 kW.—Programme in Flemish. **12 Noon,** Concert by the Small Station Orchestra, conducted by Pierre Leemans: March, Vivat Hungaria (Kálmán); Waltz, Gold and Silver (Lehár); Aubade printanière (Lacombe); Selection from The Drum-Major's Daughter (Offenbach); Violin Solo: The Canary (Poliakin); Dance of the Merry Mascots (Ketelbey); Selection from Gri-Gri (Lincke); The British Patrol (Asch); Selection from La Dame en décolleté (Yvain). **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert: Selection from The Merry Widow (Lehár); Extract from the Land of Smiles (Lehár); Air from Norma (Bellini); Selection from Follow a Star (Yellen); Polka, The Canary and the Frog; Selection from Rigoletto (Verdi); Dances (Lanner); Quadrille from Orpheus in the Underworld (Offenbach). **2.0,** Educational Programme. **5.0,** Concert by the Radio Orchestra, conducted by Charles Walpot: Marche jubilaire (De Boeck); Extract from Gretna Green (Guiraud); Overture (Luigini); Selection from The Three Musketeers (Friml); Meditation for Violin and Orchestra (Maes); Extract from the Nutcracker Ballet (Tchaikovsky); Rubens-Marche (Benoit). **5.45,** Programme for Children. **6.30,** Gramophone Music. **7.15,** Horticultural Talk. **7.30,** Variety Item. **8.0,** Concert by the Symphony Orchestra, conducted by Arthur Meulemans: Overture, The Merry Wives of Windsor (Nicolai); Extract from Sylvia (Delibes); Pastorale (Pierné); Valses romantiques (Chabrier). **8.45,** Talk: The Fiscal System. **9.0,** Concert (contd.). **10.0,** Le Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—**4.0 p.m.,** Concert by the Station Orchestra: March (Ertl); Waltz from The Arabian Nights (Joh. Strauss); Overture, Flotte Bursche (Suppé); Suite No. 1 from L'Arlésienne (Bizet); Selection from Gasparone (Millöcker); Selection from Samson and Delilah (Saint-Saëns); Wiegenlied (Fucik); Foxtrot on Themes from Die Fledermaus (Joh. Strauss-Kochmann). In the interval at **5.0,** Radio Journal, and at **5.15,** Song Recital. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Light Music on Gramophone Records. **7.0,** Chamber Music by the Sarvache Quartet. **7.30,** Talk. **7.45,** Recital of Operetta Arias by Nia Roma. **8.15,** Pianoforte Recital by Celia Delavrancea-Lahovary. **8.45,** Radio Journal. **9.0,** Romanian Music by the Station Orchestra.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **7.45 p.m.** till **Close Down. 4.30 p.m.,** Gramophone Music. **5.30,** Programme for Workers. **6.0,** Song Recital by Wilhelm Gregor. **6.30,** Talk. **7.0,** Clarinet Recital by Julius Vaezi: Clarinet Concerto in F Minor, Op. 73, No. 1 (Weber); Canzonetta, Op. 19 (Pierné); Fantasia on Rigoletto (Verdi). **7.30,** News. **7.45,** Orchestral Concert, conducted by Freccia Massimox, relayed from the Academy of Music. Soloist: Arnold Földessy ('Cello). Passacaglia (Bach-Respighi); 'Cello Concerto (Hubay); Suite, Mother Goose (Ravel); Pictures from an Exhibition (Mussorgsky-Ravel). Weather in the interval. **9.50,** Concert of Light Music relayed from the Patria Café.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamlebaek OXY, 49.4 metres;** 0.5 kW.—**11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.2,** Concert by the Harald Andersen String Ensemble, relayed from the Hotel d'Angleterre. **1.0 p.m.,** Interval. **2.20,** Talk for Housewives. **2.30,** Concert by the Radio Orchestra, conducted by Emil Reesen: Overture, Le roi l'a dit (Delibes); Waltz (Lehar); Suite, Summer Days (Coates); Lyric Suite (Grieg); Träume (Wagner-Svendsen); Selection from Hansel and Gretel (Humperdinck); Overture, Die schone Galathee (Suppé). In an interval at **3.15** (approx.), Reading. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk. **5.15,** Elementary English Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.16,** Discussion: Christianity and Modern Science. **7.15,** Concert of Opera Music by the Radio Orchestra, conducted by Launy Grondahl: Overture, Norma (Bellini); Dances from The Bartered Bride (Smetana); Selection from Faust (Gounod); Overture, Sicilian Vespers (Verdi); Smugglers March from Carmen (Bizet); Entry of the Guests into the Wartburg, from Tannhäuser (Wagner). **8.5,** Mands Overmand (Man's Master)—Radio Sketch (Soya). **8.25,** Saxophone Duets by Poul Kisbye and Eigil Mortensen. **8.45,** Et netligt Besög (A Nocturnal Visit)—Sketch (Rudolf Löwit), arranged for Radio, **9.0,** News. **9.15,** Concert of Chamber Music, by the Gerhard Rafn Quartet: String Quartet in A, Op. 33, No. 6 (Boccherini); String Quartet No. 47 in F minor (Haydn). **10.0,** Dance Music, relayed from the Palace Hotel. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I, Orchestral Concert: Signature Tune, March of the Russian Hussars; Waltz from The Gipsy Princess (Kálmán); Accordion Solo: La Tourterelle (Demaré); Black Eyes (Ferraris); Venetian Boatman's Song (Mantovani); Little Romany (Leon); Accordion Solo: Restless Fingers (Cuvelier); Passion Flower (Kennedy). Part II, Dance Music: Goofus (King); If you'll say Yes Cherie (Noble); Vilja (Lehár); There's a Cabin in the Pines (Hill); Dawn in Montmartre (Demare); Moths around the Candle Flame (Randal); The Last Round Up (Hill); It's the Talk of the Town (Symes); Signature Tune. **12 Noon,** French Programme. **3.30 to 6.0,** Programme in English by the I.B.C. **3.30,** Orchestral Concert: Nautical Moments (arr. Winter); Pale Volga Moon (O'Hagan); Song, Throw open wide your window, dear (Calson); Selection from Wiener-Blut (Strauss); By the Swanee River (Myddleton); Violin Solo: Bohemian Song (Boldi); Barcarolle (Waldteufel); Intermezzo (arr. Ancliffe). **4.0,** Dance Music: Signature Tune, Bells of Normandy; The Wedding of Mr. Mickey Mouse; Whistling under the Moon; Ah, but it's Love; Cornflowers and Poppies; You're an Old Smoothie; Everyone loves my Marguerite; To-night; A Couple of Pals; Signature Tune. The Bells of Normandy. **4.30,** I.B.C. Nursery Corner; Birthday Greetings and Trumpets. **4.40,** Chichester and Bognor Concert of Gramophone Records: Signature Tune, The Night by the Sea; Anytime, anyday, anywhere (Washington); Tony's Wife (Adamson); Thanks (Coslow); Fairy Tale (Heykens); My Moonlight Madonna (Fibich). **A** Smoking Concert: Part I, Pity me; Dancing Butterfly (Young); Veterans of Variety; Grieg Potpourri (arr. Urbach). **5.20,** Hastings and Eastbourne Concert of Light Music: Pan and the Wood Goblins (Rathke); In Tulip Time beside the Water Mill (Ailbout); Song, Letting in the Sunshine (Gay); Narcissus (Nevin); Vienna, Vienna (Foss); Banjo Solo: Viva la Liberta; Song, Having a Good Time (Kahal); Russian Rhapsody (Nussbaum); Still I love her (Gaskill); Last Night I dreamed of you (Kálmán); Snacks in Bars (Egerer); Signature Tune. **6.0,** French Programme. **10.0 till Close Down,** Programme in English by the I.B.C. **10.0** (approx.), Accordion Band Music: All over Italy (Butler); Lucassi March (Lucassi); Medley of Swedish Airs; C'est un petit nid (Eblinger); Flor d'Espagne (Vola); Perdita (Cuvelier); La Javanette (Bozi); J'aime la Musique (Parsons). **10.30,** Dance Music: Signature Tune, Bells of Normandy; Symphony of the Breeze (Leon); Elvira (Paolita); Throw open wide your Window (May); Moths around the Candle Flame (Randal); Dinner at Eight (Fields); Solitario (Burli); Shadows on the Swanee (Young); The Last Round Up (Hill); Signature Tune. **11.0,** Talkie Time: Signature Tune, Sittin' in the Dark; The Shadow Waltz (Dubin); The little Company (Ganglberger); Selection from Wild Violets (Stolz); Smilin' Through (Penn); Song from White Horse Inn (Benatzky); There's Magic in the Air (Eyton); Mrs. Bartholomew (Ellis); Whoopee Medley (Kahn); Signature Tune. **11.30,** I.B.C. Club Concert for Brecknock Listeners. Part I, Military Band Music: Signature Tune. The Chum Song; Overture, Morning, Noon and Night (Suppé); Post Horn Gallop (Koenig); Joanna (Rhys and Cymrieg); A Birthday Serenade (Lincke); King's Guard (Kieth); Music from Noel Coward's Cavalcade; The Battle of Waterloo (Eckersberg); Gaiety Echoes. **12.5 a.m.** (Tuesday), I.B.C. Late News Bulletin. **12.10** (approx.), Club Concert (continued). Part II: Tick, Tock; Good-night little Girl of my Dreams; What a Perfect Combination; Aloha Oe; Well done Gordon; Signature Tune. **12.30,** Dance Music: Smoke Rings; Si, Si; Ninon; Dancing Butterfly; If you'll say Yes Cherie; My Own; Isn't this a Night for Love; Wood Violets. **1.0,** Dance Music: Signature Tune, Bells of Normandy; Trouble in Paradise; Who's afraid of the Big Bad Wolf; Lou'siana Lullaby; Ding, Dong, Ding; Morning, Noon and Night; Mi amor esta en el Valle; The Cage in the Window; My Moonlight Madonna; Sing another Line; Lazybones; Wedding of the Dragonflies; I've got to get up and go to work; The Three Trees; I've found the Right Girl; Sweet Dreams Pretty Lady; Carry me back to Green, Green Pastures; Oh Johanna. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.,** Time and News. **12.25,** Local

NOV. 27th MONDAY continued

News and Weather. 12.35, See **Stuttgart.** 1.40, Talk with Gramophone Illustrations: Folk Songs of the German Provinces. 2.30, Weather. 2.40, Time and Exchange. 3.0, Orchestral Concert: Soloist, Anita Franz (Soprano). 5.0 to 5.35, See **Stuttgart.** 5.35, Talk: A Student in the Wild West. 5.50, Weather, News, Exchange. Programme Announcements and Time Signal. 6.0, Transmission for all German Stations, relayed from **Stuttgart.** 7.0, Topical Talk. 7.10, November, 1933, Topical Programme. 8.0, Concert from the Saaalbau: Symphony No. 6 in A (Bruckner) by the Frankfurt Symphony Orchestra, conducted by Hans Rosbaud. 9.0, Time and News. 9.20, See **Stuttgart.** 9.30, Local News and Weather. 9.45, See **Stuttgart.** 10.0, See **Leipzig.** 11.0, See **Langenberg.** 12 **Midnight,** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—6.0 **p.m.,** Transmission for all German Stations, relayed from **Frankfurt.** 7.0, Halliglüd, A Play in North German Dialect in Two Acts (Paul Friedrich Juels). 8.0, Ballad Recital by Richard Beckmann (Pianoforte); Two Ballads, op. 118 No. 3 and Op. 10 No. 1 (Brahms); Two Ballads in G Minor, Op. 23 and F Sharp, Op. 36 (Chopin). 8.30, Heinrich Zerkaulen reads from his new book, Die Männerfuhre. 9.0, Time and News. 9.20, Concert of Light Music from the Bahnhofs-Gaststätte. 10.0, Cabaret Programme on Gramophone Records.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—10.30 **a.m.,** Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture (Azzoni); Two Pieces (Becce): (a) Leggenda d'amore, (b) Melody; First Suite (de Micheli); Overture, Romeo and Juliet (Bellini); Serenata (Tarenghi); Selection from Lucrezia Borgia (Donizetti); Serenade from I Medici (Leoncavallo); Brise de mer (Leoncavallo); Overture, Semiramis (Rossini); Marche sauvage (Pietro Florida). 12.1, Time and Weather. 12.5 **p.m.,** The Rhine—Gramophone Concert. In the intervals at 12.20 and 1.0, News. 2.0, Market Prices. 2.30, Programme for Children. 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Le Cheval de Bronze (Auber); Cockney Suite (Ketelbey); Selection from The Carnival Fairy (Kálmán); Torero-Walzer (Translateur); Debreezin (Meisel); Waltz Intermezzo, Handsome (Köhler); Musikalisches Kunterbunt (Schmalstieh); Overture to a Revue (Lincke). In the interval at 4.0, Technical Talk. 4.55, Elementary English Lesson. 5.15, Market Prices. 5.25 (from **Danzig**), Talk: Danzig in the Middle Ages. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from **Frankfurt.** 7.0, News and Weather. 7.10, Music and Wine—Concert of Drinking Songs, with Commentary: Frisch auf, ihr Musikanten—Cantata for Four Voices (Gleßle); Drinking Songs, for Choir and Harpsichord (Friderici and Schein); Drinking Songs, for Solo Voice, Strings and General Bass (Heinrich Albert and Adam Krieger); The Nuremberg Quodlibet for Voices and Instruments (Erasmus Kindermann); Songs and Quodlibets from the Augsburger Tafelkonfekt; Drinking Songs (Haydn and Mozart). 8.10, Reading (Wolfgang Hermann). 8.35, Pianoforte Recital by Hildegard Scharnick: Three Pieces from Stimmungbilder, Op. 9 (Richard Strauss): (a) Auf stillem Waldespfad, (b) Intermezzo, (c) Träumerei; Variations on a Russian Folk Song, Op. 55 (Paul Graener). 9.5, News and Weather.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 **p.m.,** and 20 kW. from 5.40 **p.m.** Programme of the Workers' Radio Society (V.A.R.A.).—11.40 **a.m.,** Concert by the Small V.A.R.A. Orchestra. 1.10 **p.m.,** Gramophone Music. 1.25, Concert of Light Music. 1.55, Concert by the Small V.A.R.A. Orchestra, conducted by de Groot: Wir gehen an der Mosel vorüber (Cornelius); Flirtation (Steck); Whistle for me (Fane); Flower Song (Lange); La Mattchiehe (Clerq); Serenade (Moszkovsky); Salut d'amour (Elgar); Pierrot's March (Bosc). 2.25, Interval. 2.40, Violin and Pianoforte Recital by Gerter and Wins: Sonata in D (Nardini); Sérénade mélancolique, Op. 26 (Tchaikovsky); Rondino, Op. 32 (Vieuxtemps). 3.10, Talk with Gramophone Illustrations. 4.10, Programme for Children. 4.40, Song and Organ Recital by De Booy and Steyn: Torna a Sorriento (di Capua); Viens danser quandmême (Delettre); Two Serenades (Leoncavallo); Ich liebe dich (Grieg); Melody (Tosti); Selection from Benvenuto Cellini (Diaz); Parlatemi d'amore (Bixio); Bravo, Bravo (Morena). 5.43, Concert of Light Music. 6.10, Talk on Music with Illustrations by Wertheim (Harpsichord), Mendes (Viola d'amore), and Lentz (Viola da Gamba). 6.50, Book Review. 7.10, Concert by the V.A.R.A. Orchestra, conducted by De Groot; Soloist, Aramesco (Songs): Overture, Dinorah (Meyerbeer); Songs: (a) Aria from L'Africaine (Meyerbeer), (b) Cavatina from Faust (Gounod); Selection from Le jongleur de Notre Dame (Massenet); Aria from Carmen (Bizet); Bacchanal from Samson and Delilah (Saint-Saëns). 7.50, S.O.S. Messages. 7.52, Recital by Wertheim (Harpsichord), Mendes (Viola d'amore), and Lentz (Viola da Gamba). 8.10, Concert (contd.): Overture, Gipsy Love (Lehár); Aria from Gipsy Love (Lehár); Aria from The Czarevitch (Lehár); Selection from A Waltz Dream (O. Straus); Songs: (a) Du bist mein Traum (Strauss-Korngold), (b) Die eine Frau (Strauss-Korngold); Selection from Countess Maritza (Kálmán). 8.55, Press Review and Gramophone Music. 9.10, Concert (contd.): French Comedy Overture (Keler-Bela); Hindu Song (Rimsky-Korsakov); Dance of the Dervishes (Bendix); Petite Suite de Concert (Coleridge Taylor) 9.40, Het einde van de Union—Radio Play (Johannsen). 10.30, Concert of Light Music.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until 3.40 **p.m.** Transmitted from Kootwijk on 50 kW. from 3.40 **p.m.** Programme of the Christian Radio Society (N.C.R.V.). 11.40 **a.m.,** Police Notes. 11.55, Gramophone Music. 12.10 **p.m.,** Organ Recital by Zwart: Sonata (Borowsky); Four Psalms (Zwart); Sonata (Mendelssohn); Pieces for Organ (Zwart); Sonata, Dankt, dankt nun alle Gott (Markull); Finale on Dutch Songs (Zwart). 1.40, Broadcast for Schools. 2.15, Talk on Gardening. 2.55, Dress-making Lesson. 3.25, Interval. 3.40, Concert by the Arnhem Instrumental Trio: Trio No. 29 in F (Haydn); Muguette (Missa); Swedish Scenes (Pedre); En flänt la blanche Laine (Pesse); Symphony (de Smetskey); Selection from Jeanne d'Arc (Gounod-Aldei); T'amo ancora (Tosti); Andante from the Sonata Op. 53 (Beethoven); Sonata No. 4 in C (Bach); Choral, Eine feste Burg (van t'Kruys-Warnars). 6.10, Answers to Correspondence. 6.40, Police Notes. 6.55, Religious News. 7.10, Answers to Correspondence (contd.). 7.40, Concert by the N.C.R.V. Orchestra, conducted by Murk; Soloist, Visser (Organ): Prelude and Fugue on Eine feste Burg (Fischer); Paraphrases; Flower Song (Lange); Four Dutch Songs; Overture, Pique Dame (Suppé); Potpourri (Morena); Nocturne (Chopin); Ständchen (Heykens); Salut d'amour (Elgar); Barcarolle (Fetras); Rustle of Spring (Sinding). In the interval at 8.40, Talk, and at 9.40, News. 10.10, Gramophone Music. 11.10 (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

NICE, 1,205 kc/s, 249 metres; 0.8 kW.—8.0 **p.m.,** Amusement Guide, Financial Report, Exchange and News. 8.10, Sports Review. 8.20, Concert. 9.0, Announcements and Weather. 9.15, Dramatic Programme. 10.30, Special Transmission for Central Europe: Concert, Melodious Memories (Finck); Trees (Rasbach); Stardust (Carmichael); Waltz (Strauss); Waltz, The Blue Danube (Joh. Strauss); Saschinka (Schirman); Selection from Mother of Pearl (O. Straus); Spanish March (Franco); The Wedding of Pierrette (Jordan); Kern Potpourri; Gershwin Potpourri; Selection from The Maid of the Mountains (Fraser Simson) Irish and Welsh Melodies (arr. Somers); Dreams of the Ocean (Gungl); Très jolie (Waldteufel); In a Monastery Garden (Ketelby); None but the Weary Heart (Heykens).

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—12.25 **p.m.,** News and Weather. 12.35, See **Stuttgart.** 1.30, Meat Market Prices. 2.0, Discussion on Insurance. 2.30, Exchange. 2.50, Political Announcements. 3.0 to 5.0, See **Frankfurt.** 5.0 to 5.35, See **Stuttgart.** 5.35, Review of the Week. 5.30, Announcements. 6.0, Transmission for all German Stations, relayed from **Stuttgart.** 7.0 to 9.0, See **Frankfurt.** 9.0, See **Frankfurt.** 9.20, See **Stuttgart.** 9.30, News, Weather and Sports Notes. 9.45 to 11.0, See **Stuttgart.** 10.0, See **Leipzig.** 11.0, Schubert Concert on Gramophone Records: The Trout Quintet in A, Op. 114; The Unfinished Symphony. 12 **Midnight,** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—11.5 **a.m.,** Concert by the Station Orchestra, conducted by Theodor Blumer: Overture, Così fan tutte (Mozart); Adagio, Allegro, Minuet and Finale from the Military Symphony in G, No. 100 (Haydn); Waltz, Aquareilen (Jos. Strauss); Petite Suite (Debussy); Overture, The Merrry Wives of Windsor (Nicolai); Liebesliederwalzer (Brahms); Radetzky March (Joh. Strauss). 12.15 **p.m.,** News. 12.30, Gramophone Concert: Marches; Potpourri of Verdi Music; Song from Martha (Flotow); Potpourri of Puccini Music; Waltz, Die Schönbrunner (Lanner). 1.15, News. 1.30 to 1.40, Notes on Art. 1.55, A Visit to a Thuringian Toy Making Town (on Gramophone Records). 2.35, Exchange. 3.0, Concert. 4.0, German Classics: Das Lalenbuck von den Schildbürgern. 4.20, Chaconne in G with Variations (Handel); Twelve Variations in C (Beethoven); Variations in B flat (Schubert). 4.50, Die Minnesänger—a Radio Sequence with Songs to the Lute. 5.20, St. Mechtilde of Magdeburg. 5.40, Exchange and News. 6.0, Transmission for all German Stations, relayed from **Stuttgart.** 7.0, Cabaret and Dance Music by the Ende Orchestra and Soloists. 9.0, News and Sports Notes. 10.0, Concert by the Station Orchestra, conducted by Theodor Blumer. Soloists: Erich Kindscher (Violin) and Alfred Jehmlich (Viola). Overture, Der dumme august (Gfaller); Selection from Der Tenor der Herzogin (Künneke); Violin Solos: (a) Tango (Albeniz), (b) La capricieuse (Elgar); Waltz, The Blue Danube (Joh. Strauss); Selection from Little Ida's Flowers (Klenau); Allegro and Scherzo for Viola and Pianoforte (Koch); North German Peasant Dances (Holzner); Gallop, Prestissimo (Waldteufel); Prinz Eitel Friedrich—Marsch (Blenkenburg). 11.0 (approx.), Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—Italian Evening.—7.0 **p.m.,** Italian Opera Music on Gramophone Records. 7.45, Concert by the Station Orchestra, conducted by Henri Pensis. 8.50, News in French. 9.0, Recital of Italian Songs and Arias by Marie-Thérèse Grosfils-De-Cuyper. 9.30, Gramophone Music. 9.50, News in German. 10.0, Concert by the Station Orchestra, conducted by Henri Pensis. Petite Suite No. 1 (Micheli); Hiawatha (Mort); The Phantom Brigade (Myddleton); March, King Cotton (Sousa). 10.25, Dance Music on Gramophone Records.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 10 kW.—10.30 **p.m.,** Popular Music. 10.45, Radio Chronicle. 11.0, Programme for Catalans Abroad. 12 **Midnight** till Close Down, I.B.C. Concert of Light Music: Hawaiian Sunset (Vandersloot); The Skater's Waltz (Waldteufel); Oh, Sailor Behave (Dubin); Garbo Gitano (Bruguera); That's my Home (Rene); Hobo, you can't Ride this Train (Armstrong); The Cuban Love Song (Stothart). 12.30 **a.m. (Tuesday),** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 **p.m.,** Chimes, Exchange, Topical Talk, Recitations and Dance Music. 8.15, Radio Journal. 8.30 (approx.), Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—3.0 **p.m.,** Concert by the Station Orchestra, conducted by Musil: Overture, Russian and Ludmilla (Glinka); Ballet Music from Pique Dame (Tchaikovsky); Polovtsian Dances from Prince Igor (Borodin); Mazurka (Seriabin); Turkish March (Mussorgsky). 3.50, See **Prague.** 5.5, Talk: The Mining Areas of Ostrava. 5.15, See **Prague.** 5.30, German Transmission: Talk on Astronomy and Talk on Russian Humorists. 6.0, See **Prague.** 6.10, See **Brno.** 6.25, See **Prague.** 6.55, Russian Song Recital. 7,25, See **Prague.** 8.30, Symphony in G—The Military (Haydn), by the Station Orchestra, conducted by Plichta. 9.0, See **Prague.** 9.15 (approx.), Close Down.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsberg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—3.30 **p.m.** Orchestral Concert, conducted by Karl List: Overture, Der Bettelstudent (Millöcker); Rondo (Sibelius); Potpourri of Weber Music; Ballad and Polonaise (Vieuxtemps); Lyric Suite (Mauss); Waltz from Der Rastelbinder (Lehár); Spanish Dance from La vida breve (Falla); Dance (Debussy). 4.45, Talk for Young People. 5.5 (from **Nürnberg**), Song Recital. 5.25, Review of Books on University Reform. 5.45, Time, Weather and Market Prices. 6.0, Transmission for all German Stations, relayed from **Stuttgart.** 7.0, Schach der Eva—Play (Julius Pohl). 8.10, Chamber Music by the Berber Quartet. 9.0, Austria. . . . 9.20, Time, Weather, News and Sports Notes. 10.0, Concert by the Station Orchestra, conducted by Karl List: Overture, Hans Heiling (Marschner); Scherzo from the Symphony in B flat (Schumann); Viola Concerto (Handel); Allegro for Organ and Strings (Mozart); German Dances (Haydn); The Farewell Symphony (Haydn). 11.30 (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres,** and **Rjukan, 671 kc/s, 447.1 metres,** and **Jelöy LCL, 6,990 kc/s, 42.92 metres.**—4.0 **p.m.,** Concert of Light Music by the Radio Ensemble, conducted by Oscar Gustavson. 5.0, German Lesson. 5.30, Reading. 6.0, Announcements, Weather and News. 6.30, Agricultural Talk. 7.0, Time Signal. 7.1, Concert. Part I—Concerto for Four Pianofortes and String Orchestra (Bach). Chaconne for Violin and Pianoforte (Vitali). Part II—La Serva Padrona—Opera in Two Acts (Pergolesi). 8.10, Political Review. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Variety Programe, relayed from **Bodö, 662 kc/s, 453.1 metres.**

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—7.0 **p.m.,** Dopolavoro Notes, Tourist Report, Agricultural Notes, Report of the Royal Geographical Society and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Chamber Music by the Station Quartet and Vincenzo Mannino (Pianoforte); Quartetto in un tempo (Mortari); Sonata in D for Pianoforte and Violin (Beethoven); Sonata for Pianoforte, Violin and 'Cello (Barbieri); Strimpellata (Castelnuovo Tedesco); Melody (Mendelssohn); Scherzo (Manno). 9.0, Gramophone Concert. 10.0, News.

PARIS

EIFFEL TOWER, Call FLE. 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals on **2,650 metres** at 9.26 **a.m.** and 10.26 **p.m.** (preliminary and 6-dot Signals).—5.45 **p.m.,** Le Journal Parlé. 7.15, Weather. 7.25, News. 7.30, Orchestral Concert, conducted by Flamcut: Overture, Hansel and Gretel (Humperdinck); Symphonic Poem, Sur la mer lointaine (Moreau); Selection from Boris Godunov (Mussorgsky). 8.0, Political Review. 8.15, Concert (contd.). Five Songs (Machabey-Ganeval): (a) Le Papillon (Lamartine), (b) O triste, triste (Verlaine), (c) Il pleut des pétales de fleurs (Samain), (d) La vie est une fleur (Samain), (e) Femme et chatte (Verlaine); Pagode au crépuscule (Flament); Wine, Woman and Song (Johann Strauss). 9.0 (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 **p.m.,** Gramophone Music: Ballet Music from The Bartered Bride (Smetana); Farandole from L'Arlésienne (Bizet); Emperor Waltz (Joh. Strauss). 7.15, Le Journal Parlé. 7.30, Hot Jazz on Gramophone Records. 8.0, Talk on Aviation. 8.30, Humorous Programme by Max Régnier and his Company. 9.0, Interval. 9.20, Guessing Competition: Who is it? 9.35, Concert, with Gramophone Music. 10.30, News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 **a.m.,** Gymnasties. 7.30, Weather and Gymnasties. 7.45, Gramophone Music: Minuet (Boccherini); Liebesfreud (Kreisler); Old Spanish Song (Aubert); Sarabande (Ferroud). 8.0, Press Review and Weather. 12 **Noon,** Gramophone Records: Extracts from Bécassine (Dandelin); Two Sketches (Devilliers); Two Sketches (Selling); Souvenir (Drdla); Two Sketches (Rodor); Le petit malade (Courteline); Eloge de vin (Daudet); Three Sketches (Bach and Laverne). 1.0 **p.m.,** Exchange, News and Weather. 1.5, Concert by Max Franey and his Orchestra. 2.0, Exchange. 3.45, Exchange. 6.20, Agricultural Talk. 6.45, Talk on the Cinema. 7.0, Book Review. 7.20, Gramophone Music: Selection from Dixie Shades (Minevitch); Suzon (Nacio-Herb Brown). 7.30, Popular Concert: Waltz, Veux-tu rêver? (Marey); An Evening at Singapore (Sylviano); Tango, Almagro (Tirarni); Foxtrot, O Tino (Leno). 7.45, News and Agricultural Talk. 8.0, Readings (Zweig). 8.30, News, Sports Notes and Weather. 8.40, Review by Paul Reboux. 8.45, Concert of Chamber Music: Pianoforte and Violin Duet (Rozsa); Songs: (a) Three Songs (Chausson), (b) Florentine Serenade (Duparc), (c) Le manoir de Rosamunde (Duparc); Pianoforte Solos: (a) Hommage à Rameau (Debussy), (b) Impromptu No. 3 in A Flat (Fauré), (c) Italian Caprice (Poulenc); Three Songs (Fauré): (a) Le parfum impérissable, (b) Soir, (c) Mandoline; Two

Songs (Debussy): (a) Green, (b) Chevaux de bois; Concert for Pianoforte, Violin and String Quartet (Chausson). In the interval at **9.15**, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.**, Musical Originalities, from **New York.** **7.30, KDKA** Home Forum. **8.0 to 9.30, New York** Relay. **8.0**, Radio Guild. **9.0**, Betty and Bob. **9.15**, Rhythmic Serenade. **9.30**, Business News and Market Reports. **9.45**, Words and Music, from **New York.** **10.0**, Uncle Tom and Betty. **10.15, KDKA** Kiddies' Klub. **10.30**, The Singing Lady, from **New York.** **10.45**, Orphan Annie, from **New York.** **11.0**, News-Reeler, Pat Haley. **11.15**, Sports and Programme Review. **11.30**, Evensong. **11.45 to 12.45 a.m. (Tuesday), New York** Relay. **11.45**, Lowell Thomas. **12 Midnight**, Amos 'n 'Andy. **12.15**, Baby Rose Marie. **12.30**, Potash and Perlmutter. **12.45**, What would you do? **1.0**, Side Show, from **New York.** **1.30**, The Silver Toppers. **1.45 to 3.30, New York** Relay. **1.45**, Red Davis. **2.0**, Sinclair Minstrels. **2.30**, Melody Moments. **3.0**, Popular Programme.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.**, See **Moravska-Ostrava.** **3.50**, Programme for Children. **4.5**, Talk: The Spirit and Practice of American Schools. **4.15**, Gramophone Music. **4.35**, Elementary English Lesson. **4.50**, Gramophone Music. **5.5**, Agricultural Programme. **5.15**, Talk for Workers: The International Situation. **5.25**, News in German. **5.30**, German Transmission: Two Talks. **6.0**, Time, News and Weather. **6.10**, See **Brno.** **6.25**, Concerto for Oboe, Bassoon and Pianoforte (Milde). **6.40**, Reading. **6.55**, See **Brno.** **7.25**, Don Quixote in Music and Literature—Concert by the Station Orchestra, with Commentary: Burlesque, The Knight, for Pianoforte (Finke); Song from Don Quixote (Purcell); Song from Don Sancho (Liszt); Music to Dyk's Don Quixote (Kricka); Symphonic Poem, Don Quixote (R. Strauss); Chaliapine: Song from the Sound Film, Don Quixote (Ibert), on Gramophone Records. **8.30**, Sonata in B Minor, for Violin and Pianoforte, Op. 10 (Foerster), played by Novák and Sole. **9.0**, Time, News and Sports Notes. **9.15**, Talk in German: Winter Sports in Bohemia. **9.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.: and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28**, Time Signal from Neuchâtel Observatory. **11.30**, News and Weather. **11.40** (from **Geneva**), Gramophone Concert. **12 Noon** (from **Geneva**), Financial Notes. **12.10 p.m.** (from **Geneva**), Gramophone Concert (contd.). **1.0**, Interval. **2.58**, Time Signal from Neuchâtel Observatory. **3.0**, See **Schweizerischer Landessender.** **4.0**, Gramophone Concert of Swiss Choral Music. **4.30**, Concert by the Station Orchestra. **5.0** (from **Lausanne**), Book-keeping Lesson. **5.30** (from **Lausanne**), Programme for Children. **5.55** (from **Lausanne**), Italian Lesson. **6.20** (from **Lausanne**), Talk: The Prevention of Motor Accidents. **6.45** (from **Lausanne**), Notes on the Broadcasts for Schools. **6.59** (from **Lausanne**), Weather Report. **7.0** (from **Lausanne**), Song Recital by Mme. Nicod-Burnens. **7.15** (from **Lausanne**), Talk on the following Transmission. **7.30** (from **Lausanne**), Concert by the Station Orchestra, conducted by Ansermet, relayed from the Municipal Theatre. Soloist: Nathan Milstein (Violin). In the interval, News and Weather. **9.30** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres,** from **7.45 p.m.**, and **2RO, 11,810 kc/s, 25.4 metres.**—**12 Noon to 1.15 p.m.**, Gramophone Concert. In the intervals at **12.30**, Giornale Radio and Exchange, and at **1.0**, Time and Announcements. **3.30**, Children's Radio Review. **3.55**, Giornale Radio and Exchange. **4.10**, Weather Forecast. **4.15**, Talk. **4.30**, Soprano Song Recital by Laura Pasini, relayed from the Royal Philharmonic Academy. **5.40 (Naples)**, Shipping and Sports Notes. **5.45**, Dopolavoro Announcements and Tourist Report. **6.10**, Agricultural Notes and Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Giornale Radio. **7.0**, Time and Announcements. **7.30**, Giornale Radio and Sports Notes. **7.45**, Concert of Light Music. In the interval, Talk. **10.0**, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres**, and by **W2XAD** on **19.56 metres.**—**7.30 p.m.**, Revolving Stage, from **New York.** **8.0**, Health Hunters. **8.15 to 8.30** (approx.), Soloist, from **New York.** **12.45 a.m. (Tuesday)**, Stock Reports. **1.0 to 4.0, New York** Relay. **1.0**, Snoozyland Sketch. **1.30**, String Symphony. **2.0**, A. and P. Gipsies. **2.30**, Popular Programme. **3.0**, Variety Programme. **3.30**, Drama K-7. **4.0**, Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.: **Basle, 1,229 kc/s, 244.1 metres,** and **Berne, 1,220 kc/s, 245.9 metres. 5.50 a.m.** (from **Zürich**), Ski-ing Lesson. **6.5**, Interval. **9.20** (from **Basle**), Broadcast for Schools. A Musical Journey through Europe. **9.50**, Interval. **11.0** (from **Basle**), Round the World—Gramophone Concert. **11.29**, Time Signal from Neuchâtel Observatory. **11.40** (from **Basle**), Gramophone Concert (contd.). **12.25 p.m.** (from **Basle**), Time, Weather and Exchange. **2.30** (from **Basle**), Dance Music on Gramophone Records. **3.0** (from **Basle**), Concert of Chamber Music by the Radio Quintet. **4.0**, Swiss Songs for Choir (on Gramophone Records). **4.30**, Light Music by the Station Orchestra. **5.0** (from **Basle**), Songs by a Children's Choir. **5.30** (from **Zürich**), Talk in Dialect. **6.0**, Time and Weather. **6.5** (from **Zürich**), Gramophone Concert. **6.20** (from **Zürich**), Elementary English Lesson. **6.50** (from **Zürich**), Fifth Subscription Concert, relayed from the Tonhalle. In the interval at **8.0** (approx.), Weather and News. After the Concert, Dance Music on Gramophone Records. **9.15** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres,** and **Sundsvall, 554 kc/s, 542 metres.** **12 Noon to 12.35 p.m.**, Broadcast for Schools. **4.5**, Provincial Programme, relayed from **Falun, 977 kc/s, 307 metres.** **4.25**, Reading. **4.45**, Gramophone Music. **5.45**, Elementary German Lesson. **6.15**, Weather and News. **6.30**, Astronomical Talk: The Milky Way, relayed from **Malmö, 1,301 kc/s, 230.6 metres.** **7.0**, String Quartet in D, Op. 11 (Tchaikovsky) by the Danish Quartet. **7.35**, Talk. **7.50**, Variety Programme. **8.20**, Talk. **8.45**, Weather and News. **9.0**, Report by a Night Worker, followed by Orchestral Music.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.**, Gramophone Records. **12.45 p.m.**, News, Time and Exchange. **1.5**, Light Music on Gramophone Records. **2.0**, Interval. **5.0**, Orchestral Concert, conducted by Roskam: March, Dawn of Freedom (Lotter); A bâtons rompus (Gillet); Waltz, Un jour à Seville (Waldteufel); Esquisses flamandes (Brüsselmans); Overture, Les petites Michus (Messager); Selection from Le châlet (Adam); 'Cello Solo: Rêve (d'Ambrosio); March, The Grand Victory (Savasta). **6.0**, Fortnightly Review of Literature. **6.15**, Topical Talk in German. **6.30**, Gramophone Concert. **7.30**, Time and News. **7.45**, Gramophone Music. **8.0**, Press Review in German and Lottery Results. **8.30**, Concert of Alsatian Music by the Station Orchestra and Soloists. Conductor, Maurice de Villars. Suite in D Minor (Erb); Two Melodies (Erb): (a) Berceuse, (b) La barque; Menuet galant (Erb); Ronde de nuit (Erb); Two Melodies (Gross): (a) Cette petite, (b) D'r Hans; Scènes foraines dans un village d'Alsace (Klein); Two Melodies (Gross): (a) Fileuse, (b) Berceuse; Two Pieces for Orchestra (Schirlé): (a) Pastorale, (b) Fileuse; A la Source du Mont Sainte-Odile (Schirlé); Two Melodies (North); Asiatic Suite for Orchestra (Pohl); Sextet for Strings (Adam). In the interval at **9.30**, Press Review in French. **10.30** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.25 p.m.**, Local News and Weather. **12.35 p.m.**, Gramophone Records of the Vienna Philharmonic Orchestra and Paul Bender (Songs). Kaisermarsch (Wagner); Song: Der Erlkönig (Loewe); Scherzo from the Fourth Symphony, in E flat (Bruckner); Song: Edward (Loewe); Suite from Der Rosenkavalier (Richard Strauss); Song: Wedding Song (Loewe); Leichtes Blut (Joh. Strauss); Sphärenklänge (Jos. Strauss); Song: Tom der Reimer (Loewe); Annen-Polka (Joh. Strauss); March from The Gipsy Baron (Joh. Strauss). **1.30 to 2.30**, Interval. **2.30**, Talk: The Lüneburger Heide. **3.0**, See **Frankfurt.** **5.0**, French Lesson. **5.20**, Technical Talk. **5.35**, Ready Reckoning Lesson. **5.50**, Time, Agricultural Notes and Weather. **6.0**, Transmission for all German Stations: First Act of The Valkyrie—Opera (Wagner). **7.0 to 9.0**, See **Frankfurt.** **9.0**, Time and News. **9.20**, Topical Talk. **9.30**, Local News, Weather and Sports Notes. **9.45**, Gramophone Music. **10.0**, See **Leipzig.** **11.0**, See **Langenberg.** **12 Midnight** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.**, News. **6.15**, Accordion Solos. **6.30**, Chansonnettes. **6.45**, Operetta Music: Selection from The Dollar Princess (Fall); Selection from Les noces de Jeannette (Massé); Aria from Kadubec (Yvain). **7.0**, Music from Sound Films. **7.15**, News. **7.30**, Violin Recital: Old Viennese Waltz (Kreisler); Die Biene (Schubert); Spanish Dance (Granados); Roses of Picardy (Haydn Wood). **7.45**, Opera Music: Arias from Marouf (Rabaud); Sappho (Massenet), Le roi malgré lui (Chabrier), and Romeo and Juliet (Gounod). **8.0**, Light Music. **8.15**, Music by an Argentine Band. **8.30**, Military Music. **8.45**, Opera Music: Micaëla's Aria from Carmen (Bizet); Prayer from William Tell (Rossini); Aria from Les Huguenots (Meyerbeer); Aria from Messaline (de Lara). **9.0**, Concert by the Station Orchestra, conducted by Espy: Overture, A Festival in Aranjuez (Demerssemann); Alsatian Dances (Levadé); Selection from Là Haut (Yvain); Waltz, Wienerblut (Strauss); Selection from La Bohème (Puccini); Reverie d'un soir, and Marche militaire from Suite algérienne (Saint-Saëns). In the interval, Light Music. **10.15**, News. **10.30**, Programme for Listeners in Morocco. Part I—Songs. Part II—Hawaiian Guitar Music. **10.50**, Tourist Talk. **11.0**, Request Music. **11.15**, Dance Music. **12 Midnight**, News and Weather. **12.5 a.m. (Tuesday)**, Operetta Music: Arias from Le postillon de Longjumeau (Adam); Le Comte Obligado (Moretti), and Elle est à vous (Yvain). **12.15**, Orchestral Music: Overture, Semiramis (Rossini); Ballet egyptien (Luigini). **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

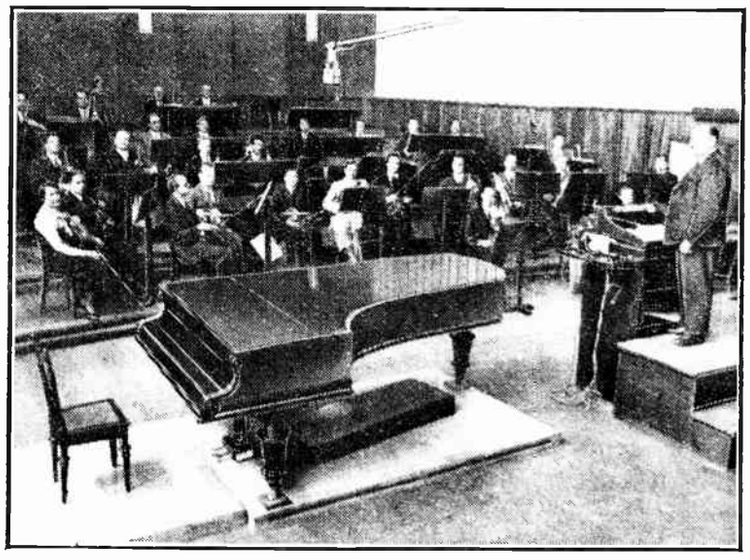
1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres,** and **Florence, 598 kc/s, 501.6 metres.** **4.10 p.m.**, Orchestral Concert, conducted by Tito Petralia. **5.0 to 5.5**, Weather. **5.40**, Giornale Radio, Dopolavoro Announcements and Gramophone Music. **6.0**, Time, Tourist Report and Gramophone Music. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Gramophone Music. **7.0**, Announcements, Giornale Radio and Weather. **7.15**, Request Programme. **8.15**, A Play in One Act. **8.45**, Concert of Chamber Music. **9.30**, Dance Music on Gramophone Records. **10.0**, Giornale Radio.

VATICAN CITY

15,120 kc/s, 49.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.**, Religious Information in Italian. **7.0 to 7.15 p.m.**, Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**10.30 a.m.**, Concert by the Wiener Symphoniker, conducted by Josef Holzer. Overture, Irrfahrt uns (Glück) (Suppé); Waltz from Das Fürstenkind (Lehar); Deutsche Marschperlen (Blankenburg); Suite (O. Wagner); Waltz, Donauweibchen (Joh. Strauss); Romance for Bugle Horn (Landl); Gavotte (Czibulka); Nur ein Lied und ein Mädel aus Wien (Schieder); Humoresque (Mayer-Aichhorn); Violin Solo: Meditation (Glazunov); Selection from Polenblut (Nedbal). In the interval at **0.53**, Weather. **12 Noon**, Time, News and Programme Announcements. **12.10 to 1.0 p.m.**, Gramophone Records. **2.0**, Time, Weather and Exchange. **2.15**, Talk: Clean Milk. **2.25**, Pianoforte Sonata in F (Mozart), by Lili Gutovsky) and Gertrud Zerner. **2.50**, Sound Film Music on Gramophone Records. **3.35**, Talk: Schloss Kreuzenstein and its History. **4.0**, Talk: Great Composers and Singers of the last Thirty Years. **4.25**, Soprano and 'Cello Recital by Molly Jonas and Richard Krotschak. **5.5**, Talk: Theatrical Review. **5.25**, Talk: Books and Works of Reference in connection with the Week's Talks. **5.30**, Elementary English Lesson. **6.0**, Concert by the Wiener Symphoniker, conducted by Philipp de la Cerda. Overture, Semiramis (Rossini); Bilder aus dem Osten (Schumann); Ballet Music from The Queen of Sheba (Gounod); Entry March from The Queen of Sheba (Goldmark); Suite, Aus dem Morgenlande (Henberger); Selection from Hérodiade (Massenet). In the interval at **6.35**, Time, Weather and Programme Announcements. **7.15**, Topical Programme. **7.30**, Austrian Folk Music—Wireless Potpourri (Riedinger). The Wiener Symphoniker, conducted by Josef Holzer, the Vienna Boys' Choir, and Soloists. **8.45**, News. **9.0**, Gramophone Concert, followed by Announcements.



SWISS FAVOURITES. The well-known orchestra at the Zurich studio, from which performances are broadcast through Schweizerischer Landessender (Beromunster).

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.**, Time Signal and Fanfare from the Tower of St. Mary's Church, Cracow. **11.5**, Wagner Music on Gramophone Records. **11.30**, Radio Journal. **11.35**, Weather. **11.38**, Gramophone Music. **12 Noon**, Interval. **2.25**, Announcements. **2.40**, Report for Boy Scouts. **2.45**, Aviation Report and Anti-Gas Drill. **2.55**, Songs on Gramophone Records. **3.40**, Elementary French Lesson. **3.55**, Concert by the Bulin Quintet. **4.50**, Agricultural Correspondence. **5.0**, Talk: Problems of National Culture. **5.20**, Pianoforte Recital by Helene Ottaw: Sicilienne (Respighi); Passacaglia (Roncalli-Respighi); Etude in A flat, Op. 25 (Chopin); Etude in C sharp minor, Op. 25 (Chopin); Gretchen am Spinnrad (Schubert-Liszt); Spinning Song from The Flying Dutchman (Wagner); L'île joyeuse (Debussy); Toccata (Debussy). **6.0**, Programme Announcements. **6.25**, Talk relayed from **Cracow, 959 kc/s, 312.8 metres.** **6.40**, Sports Notes. **6.47**, Radio Journal. **7.0**, Concert by the Station Orchestra, conducted by Nawrot. Soloist: Olga Szumska (Songs). Overture, Banditenstreiche (Suppé); Andalusian Nocturne (Infante); Waltz (Joh. Strauss); Four Songs; Serenade (Suk); Ballet Suite (Gyldmark); Melody (Milhaud); Harvesters (Powiadowsky); Three Songs; Roses d'hiver (Waldteufel); Polonaise (Lewak); March on Themes from Carmen (Bizet). In the interval at **8.0**, Talk. **9.0**, Dance Music, relayed from the Gastronomia Café. **10.0**, Aviation Weather Report and Police Notes. **10.5**, Dance Music (contd.).

ZURICH.—See **Schweizerischer Landessender.**

NOV. 27th MONDAY *continued*

TUESDAY

NOVEMBER THE TWENTY-EIGHTH

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.40,** News. **7.0,** Gaelic Reading. **7.15,** Talk. **7.30,** Time Signal. **7.31,** Flute and Harp Duets by Mollie Flynn and A. Fagan. **7.55,** Mezzo-Soprano Solos by Cecily Kenny. **8.10,** The Station Orchestra. **8.45,** Violin Solos by Nora Richardson. **9.0,** Lecture Recital by Grace O'Brien. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Military Band Music: Signature Tune: Choo Choo (Malneo); March, The Entry of the Gladiators (Fucik); Praludium (Jarnefeld); The Bells of St. Malo (Rimmer); The Wedding of the Rose (Jessel); Signature Tune: Choo Choo. **9.45,** Concert of Dance Music: In the Park in Paree; When Work is through; The Shadow Waltz, Mississippi Basin. **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd. Dance Music: Dixie Doorway; That's my Home; I give my Heart; Racing Commentary; She's my Pet; I can't remember; Shuffle off to Buffalo; You're getting to be a Habit with me; Carolina Lullaby. **10.30,** I.B.C. Good-night Melody, followed by News and Weather. **10.40,** Pipe and Fiddle Duets by L. Rowsome and M. Dunne. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert: Minuet No. 2 in G (Beethoven); Extase (Ganne); Selection from The Twilight of the Gods (Wagner); Serenata (Rachmaninov); Symphonic Entr'acte (Desprez); Musette (Colin); Selection from The Pearl Fishers (Bizet). **7.0,** Request Gramophone Records. **7.30,** Exchange and Talk in Catalan. **8.0,** Gramophone Music. **8.30,** Educational Programme: Geography and History Lesson, followed by News. **9.0,** Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. **9.5,** Sponsored Programme. **9.30,** Part Relay of an Opera from the Gran Teatro del Liceo. In the interval at **11.0,** News.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Quintet Concert. **3.55** (approx.) **to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**6.0 p.m.,** Opera Arias by Paul Freilich. **6.30,** Talk. **7.10,** Quartet (Smetana). **7.50,** Talk. **8.0,** Popular Albanian Songs. **9.0,** Time and News. **9.15** (approx.), Concert by the Station Orchestra.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**1.0 p.m.,** Gramophone Concert. Ständchen (Schubert); Wiengenlied (Mozart); Der Vogel im Walde (Taubert); An die Musik (Schubert); Mandnacht (Schumann); Ich liebe Dich (Beethoven); Gutcn Abend, gute Nacht (Brahms); Die Liebe sass als Nachtigall (Kaun); Maria sitzt am Rosenhag (Reger); Auf dem Wasser zu singen (Schubert); Sandmännchen (Brahms); O komm im Traum (Liszt); An die Geliebte (Wolf); Schnsucht nach dem Frühling (Mozart); Leichesbotschaft (Schubert). **2.0,** Talk for Country Women. **2.15,** Talk: The German Woman's Right to Work. **2.30,** Weather and Exchange. **2.45,** Talk on the History of Flying: Daedalus and Icarus. **3.0,** See **Langenberg. 4.0,** Handwork for Children. **4.20,** Variety Programme. **5.0,** Poems. **5.5,** Reading. **5.25,** Political Press Review. **5.45,** Weather and News. **6.0,** Transmission for all German Stations: Der Ewige Bauer—Radio Play—(Josef Martin Bauer), with Music by Rudolf Wagner-Regeny. **7.0,** Talk by Dr. Paul Fleischer: German Workers in the Struggle for Germany's Equality as a Nation. **7.10,** The Day's Motto. **7.15,** See **Berlin (Funkstunde). 8.10,** Report of the Laying of the Foundation Stone of the Kunstmark Open Air Theatre on Gross-Glienicker Lake (on Gramophone Records). **9.0** Weather, News and Sports Notes. **9.45,** Weather. **10.0,** Concert from **Hamburg. 11.0** (approx.) Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—2.20 p.m.,** Chamber Music Concert on Gramophone Records: Pianoforte Solo, Die Quelle (Schmalstich); Violin Solos: (a) Melody (Glück), (b) Canzonetta (d'Ambrosio); 'Cello Solos: (a) Wiegenlied (Klengel), (b) Scherzo (Klengel); Pianoforte Solos: (a) Malagueña (Albeniz), (b) Seguidilla (Albeniz). **2.45,** Talk on Sport for **Young People. 3.0,** Schubert Song Recital (on Gramophone Records): Das Rosenband; Der Musensohn; Am Bach im Frühling; Mein. **3.15,** Talk: The Wonders of Nature. **3.30,** Concert, from **Langenberg. 4.30,** Radio Picture about Johann Gottfried Seume (Wolfgang Weyrauch). **5.0,** Review of Books. **5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Announcements. **7.15,** Symphony in C, No. 7 (Schubert), by the Berlin Wireless Orchestra, conducted by Eugen Jochum. **8.5,** Between Evening and Night—Reading of November Poems. **8.15,** Septet in E flat, Op. 20 (Beethoven). **9.0,** News. **9.20,** See **Hamburg. 11.0** (approx.). Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**3.0 p.m.,** Concert by the Station Orchestra. **3.55,** Programme from **Brno. 4.15,** See **Prague. 4.35,** Talk. **4.50,** Chopin Pianoforte Recital by Vilem Pistelek: Scherzo, Op. 31; Fantasia Impromptu, Op. 66. **5.10,** Educational Talk: Experiences of a Lecturer. **5.40,** Lesson in Telegraphy. **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.30,** Concert by the Station Orchestra. **7.0,** See **Brno. 9.0,** See **Prague. 10.0** (approx.). Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—11.5 a.m.,** Concert by the Silesian Philharmonic Orchestra, conducted by Behr: Overture, Anacreon (Cherubini); Cassation No. 1 (Mozart); Five German Dances (Schubert); Overture, Preciosa (Weber); Wedding Music (Jensen); Styrian Dances (Lanner); Overture, Semiramis (Rossini); Elegy and Waltz from Op. 48 (Tchaikovsky); Mazurka, Lob der Frauen (Strauss). In the interval at **12.45 p.m.,** Time, Weather, News, and Exchange **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.20,** Listen, Everybody! **2.30,** Programme for Children. **3.0** (from **Gleiwitz**). Concert of Light Music, relayed from the Haus Oberschlesien. **4.30,** Agricultural Prices. **4.35,** Talk: The Religious Tendencies of Contemporary German Youth. **5.0,** Talk: Peasant Colonisation—its History and its Aims. **5.20,** Programme to be announced. **5.40,** Programme Announcements and Meat Market Report. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Request Concert by the Station Orchestra, conducted by Topitz. Soloist: Helmut Hellendorf (Tenor). **8.20,** News. **8.25,** Hermann Löns—Radio Pictures from the Author's Life and Work (Kaupert). **9.15,** Time, Weather, and Announcements. **9.40,** Political Press Review. **10.0,** Die Liebe, ja die Liebe—Cabaret on Gramophone Records (arr. Odda). **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News, Talk on Cuba and Agricultural Report. **6.0,** See **Prague. 6.30,** Saxophone Solos. **6.45,** A Report from a Hospital in **Brno. 7.0,** The Mikado—Comic Opera in Two Acts (Sullivan). **9.0,** See **Prague. 10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans: Danse des enfants (Honegger); Sérénade à Mabel (Godard); Solitude de Pierrot (Messager); Intermezzo (Mussorgsky). **12.20 p.m.,** Pianoforte Recital by Sophie Tuyns: St. François de Paul (Liszt); Toccata (Saint-Saëns); L'ile joyeuse (Debussy). **12.40,** Orchestral Concert (contd.): Romance sans paroles, Op. 17 (Fauré); Ton nom (Holmès); Parmi les roses (Nérini); Elegy (Rachmaninov); Idyll (Cassado). **1.0,** Le Journal Parlé. **1.10,** Gramophone Music; Part I: Extracts from Sound Films; Part II: Opera Music. **1.45,** Selection from Don Juan (R. Strauss), on Gramophone Records. **5.0,** Concert of Belgian Music by the Radio Orchestra, conducted by Franz André: Suite pastorale (Vreuls); Nocturne (Daneau); Russian Rhapsody (Leemans). **5.30,** Programme for Children. **6.5,** Talk. **6.15,** Sonata for 'Cello and Pianoforte (Harsanyi), by Hans Kindler ('Cello) and the Composer. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Passe-pied Henry II (Balleron); Sixteenth Century Rondean (Nérini); Ballet Louis XIV (Pouget); Suite of Scottish Airs (Gilson). **7.15,** Review of the Week. **7.30,** Programme for Women and Art Review. **8.0,** Concert by the Radio Orchestra, conducted by Franz André: Good Night Mr. Nightingale (Pollack); I can't remember (Berlin); Rhapsody in Blue (Gershwin); In the Valley of the Moon (Tobias); Jumpin' up and down (Confrey); Butterflies in the Rain (Warren); Let's all sing like the Birdies sing (Evans). **8.45,** Educational Talk. **9.0,** Concert by the Station Symphony Orchestra, conducted by Kumps; Soloist, Danielle Claes (Songs): Overture, Si j'étais roi (Adam); Aria from Hamlet (Thomas); Ballet Music from Le Cid (Massenet); Overture, William Tell (Rossini); Aria from Madame Butterfly (Puccini); Prelude, Sicilienne and Intermezzo from Cavalleria Rusticana (Mascagni). **9.45,** Fauré Song Recital by Danielle Claes: Fleur jetée; Tristesse; Notre amour. **9.55,** Christus vincit (Liszt). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Gramophone Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Pierre Leemans: March (Myddleton); Overture, Banditenstreiche (Suppé); Bonheur caprincieux (Bürger); Selection from The Gipsy Princess (Kálmán); Gramophone Records: Slav Dance No. 5 (Dvorak); Tango, Frasquita (Coppola); Valse d'amour (Heymann); Pasodoble, Viva Palma (Brockler). **5.0,** Concert by the Symphony Orchestra, conducted by Jean Kumps: Overture, Charlotte Corday (Benoit); The Unfinished Symphony (Schubert); Two Songs on Gramophone Records; Slav Dance (Chabrier); Fantasia No. 3 (Benoit-Broeckx); Waltz from Der Rosenkavalier (R. Strauss); Tarantella (Cui). **5.45,** Programme for Children. **6.30,** Gramophone Records: Selection from (a) Ball at the Savoy (Abraham) and (b) Viktoria and her Hussar (Abraham); Waltz, Parla (Auditi); La campanera (Arditi); Selection from White Horse Inn (Benatzky). **7.0,** Gramophone Records of Richard Tauber: Lorelei (Silcher); Five Songs from the Cycle Dichterliebe (Schumann). **7.15,** Talk: Is Democracy Doomed? **7.30,** Le Journal Parlé. **8.0,** Karel Albert Concert by the Symphony Orchestra, conducted by Jean Kumps: Soloist, Jef Van Schoeland (Songs): Intermezzo; De wilde jacht, from Thyl; Two Songs: (a) Wij hebben geen geld, (b) Het lied van den smid; Suite Beestenspel. **9.0** (approx.), Dramatic Programme. **9.15,** Concert by the Radio Orchestra, conducted by Franz André: Soloist, Jef Van Schoeland (Songs); Overture, The Merry Wives of Windsor (Nicolai); Nocturne (Chopin); Songs: (a) Tom the Rhymer (Loewe), (b) Kameraad (Jef Van Hoof); Extase (Ganne); Bassoon Solo: Der alte Brumbär (Fucik); Xylophone Solo: Verbiage (Fetras); Song (Eysler); Wir marschieren (Donliez). **10.0,** Le Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—**4.0 p.m.,** Concert of Variety Music by the Gica Ionesco Orchestra. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Song Recital by Lya Popovici-Vergu: Reverie (Hahn); May (Hahn); Vorrei (Tosti); Aria from Manon (Massenet); Aria from Frasquita (Lehár). **7.20,** Symphony Concert by the Station Orchestra, conducted by Georgesco; Soloist, Mlle. Chelaru-Serbesco (Pianoforte): Symphony in D (Haydn); Pianoforte Concerto (Rachmaninov); Symphony No. 1 (Beethoven). In the interval at **8.0,** Talk. **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **840 metres** from **6.30 p.m.** till **Close Down.—4.0 p.m.,** Dance Music from the Hotel Britannia. **5.0,** French Lesson. **5.25,** 'Cello Recital by Nicholas Zsamboki. **6.0,** Reading. **6.30,** Talk, with Gramophone Illustrations: An Hour in Italy. **7.30,** News. **7.45,** Organ and Song Recital by Ludwig Akom and Gizella Rituper, relayed from the Academy of Music: Prelude and Fugue in D (Bach); Benedictus (Reger); Pastorale (Scarlatti); Three Songs: (a) Ave Maria, from Othello (Verdi), (b) La Procession (Franck), (c) Ah Perfido (Beethoven); Symphony No. 6 for Organ (Widor); Wolken wandern (Antalffy); Toccata (Barie); Berceuse (Pierné); Dance of the Fairies (Bonnet); Songs: (a) Lied (Bach), (b) Spring Song (Mendelssohn), (c) Aria from Tannhäuser (Wagner); Scherzo (Bossi). **9.30,** Weather. **9.40** (approx.). Concert of Cigány Music from the Café Metropole.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres,** and **Skamlebaek OXY, 49.4 metres;** 0.5 kW.—**11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.2** Concert by the A. Bendix String Ensemble, relayed from the Wivex Restaurant. **1.0 p.m.,** Interval. **1.40,** Concert by the Radio Orchestra, conducted by Launy Gröndahl: Soloist: Else Ammentorp (Songs); March: Folies bergère (Lincke); Overture, Gustave III (Auber); Indian Intermezzo (Morena); Selection from The Little Dutch Girl (Kálmán); Marche lorraine (Ganne); Overture, Isabella (Suppé); Two Old Danish Folk Melodies (Alfred Strandqvist); Waltz, Blondes ou brunes (Ganne); Extracts from Gurre (Halvorsen); Arabesque No. 2 in G (Debussy); Mazurka from Halka (Moniuszko). In an interval at **3.30** (approx.), Danish Folk Songs. **3.40,** Programme for Children. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk. **5.15,** Elementary German Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk. **7.0,** Time Signal from the Town Hall. **7.1,** Missionary Society Jubilee Programme, relayed from **Veile. 8.10,** Gramophone Records of Famous Artists. **8.30,** A Visit with the Microphone to a Bookseller's. **9.0,** News. **9.15,** Concert of Italian Music by the Radio Orchestra, conducted by Fritz Mahler; Suite No. 1, Antiche Danze ed Arie (Respighi); Serenade for Small Orchestra (Casella). **10.0,** Dance Music, relayed from the Lodberg Restaurant. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**10.30 a.m. to 12 Noon,** Programme in English by the I.B.C. **10.30,** Concert: Signature Tune. It beats as it sweeps as it cleans; The Teddy Bears' Picnic (Bratton); I want to be happy, from No, No, Nanette (Youmans); Stormy Weather (Arlen); Veterans of Variety; The Wedding of Mr. Mickey Mouse (Pola); Try a little tenderness (Woods); You're getting to be a habit with me (Dubin); Oh, Johanna (Lawrence); Signature Tune. **11.0,** Happy House. Part I. Military Music: Signature Tune; Jolly Fellows (Vollstedt); La Benédiction des Poignards (Meyerbeer); March (Mohr); Waltz, Les Sirènes (Waldteufel); The Doge's March (Rosse); Cupid's Army (Sievier); Selection from The Miracle (Humperdinck); Here, there and everywhere (Bosc). Part II, Dance Music: The Wedding of Mr. Mickey Mouse; Cecilia Mia; Tick, Tock; Dinner at Eight; Adios, Goodbye; Oh, Johanna; Shadows in the Swanee; My Moonlight Madonna; Signature Tune. **12 Noon,** Programme in French. **3.30 to 6.0,** Programme in English by the I.B.C. **3.30,** Light Music: The Brooklyn Cakewalk (Thurban); In a Clock Store (Orth); Siboney (Lecuona); Pianoforte Selection, Words and Music (Coward); Happy Darkies (Godfrey); Gipsy Moon (Borganov); Baby, won't you please come home? The Musical Clock of Madame Pompadour (Noack). **4.0,** Dance Music: Signature Tune. The Bells of Normandy; Who's afraid of the big bad Wolf? About this time next week; My Moonlight Madonna; Tick, Tock; The Last Round Up; Let the World go drifting by; The Cage in the Window; Don't blame me; Signature Tune. **4.30,** I.B.C. Nursery Corner; Birthday Greetings; Trumpets. **4.40,** Torquay and Exeter Concert of Operatic Music: Signature Tune, The Night by the Sea; Prelude to Carmen (Bizet); Barcarolle from The Tales of Hoffmann (Offenbach); O Star of Eve, from Tannhäuser (Wagner); Selection from Cavalleria rusticana (Mascagni); Anvil Chorus from Il Trovatore (Verdi); The Stars were shining, from Tosca (Puccini); Selection from Faust (Gounod); Prize Song, from The Mastersingers (Wagner); Selection from I Pagliacci (Leoncavallo); One Fine Day, from Madame Butterfly (Puccini). **5.20,** Plymouth and Devonport Concert of Light Music: March, La Czarine (Ganne); The Clatter of the Clogs (Flynn); My Hero, from The Chocolate Soldier (Oscar Straus); Pianoforte Selection, He wanted Adventure; Song, Reflections in the Water (Loeb); The Dance of the Nymphs (Birch); A Charming Episode (Ormandy); Signature Tune. **5.45,** Concert: Put on your old grey bonnet (Wenrich); Solitario (Burli); Sophisticated Lady (Ellington); I bring a song (Young). **6.0,** Programme in French. **10.0** (approx.) till Close Down, Programme in English by the I.B.C. **10.0** (approx.), I.B.C. Members' Request Hour: Selection, The Maid of the Mountains (Fraser-Simson); The Rangers' Song; Indian Love Call, from Rose Marie (Friml); Moonstruck (Coslow); Lay your head on my shoulder (Conrad); Destiny Waltz (Baynes); Learn to croon (Coslow); The Dance of the Cuckoos. **10.30,** Dance Music: Signature Tune Bells of Normandy; Let's make Up; Ding, Dong, Ding; Zigeuner, you have stolen my heart; Moths around the candle flame; It's the Talk of the Town; Reflections in the Water; Lazybones; Let's call it a Day; Signature Tune. **11.0,** Talkie Time—Tunes from the Talkies and Shows; Signature Tune, Sittin' in the Dark; Selection, Music in the Air; Vilja Song, from The Merry Widow (Lehár); A Glass of Golden Bubbles (Strauss); I've got you on my mind (Porter); I've found the right girl

(Lupino); A girl like Nina (Abraham); Butterfly Song, from Waltz Time (Strauss); She's everybody's sweetheart now (Hargreaves); Signature Tune. **11.30**, Concert by the International Broadcasting Company (Ireland), Ltd.; Signature Tune, Come back to Erin; The Fortune Teller (Herbert); Evolution of Dixie (Lake); Fairy Tales of Ireland (Coates); Singing a song to the Stars (Meyer); Selection from Naïla (Delibes); Irish Song Medley; Southern Rhapsody (Hosmer); The Way to the Heart (Lincke); Signature Tune, Come back to Erin. **12.5 a.m. (Wednesday),** News Bulletin in English. **12.10** (approx.), Club Concert for Crickhowell Listeners: Signature Tune, The Chum Song; Oh, Johanna (Lawrence); La Cumparsita (Rodriguez); Sundown in a little Green Hollow (Whiting); I'll show you off (Abraham); My Kingdom for a smile from you (Kling); Happy as the day is long (Koehler); I've got to get up and go to work (Hupfeld); Passion Flower (Kennedy); If I had someone to love (Hill); Dear Stranger (Hansen); Dancing Butterfly (Yung); There's a Cabin in the Pines (Hill); You're an old Smoothie (Whiting). **1.0 a.m.,** Mandoline Band: The Blue Danube (Strauss); In Old Seville (Ege); Mandolinata (di Pietro); Some of these days (Brookes); Czardas (Monti); Mandoline (Thomé); Loin du bal (Gillet). **1.30,** Choral Music: When the Lilac blooms again (Rotter); The Lincolnshire Poacher (Trad.); Minstrel Memories: Orchestral, Overture 1914 (arr. Somers); The Flower of Hawaii (Abraham); Chinatown, Chinatown (Schwartz); Mighty like a Rose (Clutsam); Orchestra: Waltz Favourites (Ancliffe). **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel, 1,220 kc/s, 245.9 metres;** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** See **Stuttgart. 1.40,** Hints for the Housewife. **2.30,** Weather. **2.45,** Time and Market Prices. **3.0,** See **Langenberg. 5.0,** Italian Lesson. **5.20,** On the Conveyer Belt—Miniature Report and Discussion. **5.35,** Talk on Education. **5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10 to 9.0,** See **Langenberg. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** Local News and Weather. **9.45,** See **Stuttgart. 10.0,** Programme to be announced. **10.30,** See **Stuttgart. 11.0** (also on **Zeesen, 31.38 metres),** Talk: The German Lyric. **11.45** (approx.), Close Down.

FREDERIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m.,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Concert by the Hamburg Philharmonic Orchestra, conducted by Eibenschütz: Suite No. 3 for Orchestra (Wedig); Symphony in D minor, Op. 27 (Strässer). **8.20,** Magie im Hinterhaus'—Radio Play (Manuel and Reimann). **9.0,** Time, Weather and Announcements. **9.20,** Concert of Scandinavian Music by the Small Station Orchestra. Conductor: Gerhard Maasz (Pianoforte): Overture, Nachtklänge von Ossian (Gade); Valse triste (Sibelius); Pastoral Suite No. 34 (Atterburg); Polonaise (Svendsen); Entry March of the Boyards (Halvorsen). Pianoforte Solos: (a) Evening (Palmgren), (b) Summer Evening (Grieg), (c) Nocturne (Grieg); Dance Scene (Nielsen); Ballet Suite (Gyldmark); Grotesque March (Sinding); Two Swedish Dances (Aulin); Nocturne from the Music to King Christian (Sibelius)); Homage March from the Music to Sigurd Jorsalfar (Grieg).

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert. In the intervals at **12.20** and at **1.0,** News. **1.30,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Market Prices. **2.5,** Gramophone Music. **3.0,** Humorous Talk. **3.15,** Concert by the Small Station Orchestra, conducted by Wileken. Overture, The Nuremberg Doll (Adam); Suite Campestre (Amadei); Potpourri, The Three Strausses (Lindemann); Komm Cigány (Kalman); Melody (Kalman); Selection from The Land of Smiles (Lehár); Waltz, Nordseestürme (Döring); Overture, Fatinitza (Suppé). In the interval at **4.0** (approx.), Talk: Modern Fashions. **4.40,** Book Review. **4.50,** Discussion for Workers: Railway Engines and Drivers. **5.15,** Agricultural Prices. **5.25,** Ballad Recital by Paulpeter Rafalski. Three Ballads (Loewe): (a) Prinz Eugen, (b) Heinrich der Vögler, (c) Der Wirtin Töchterlein; Die Vätergruft (Liszt); Drei Wanderer (Hermann). **5.50,** Weather. **6.0,** Transmission for all German Stations relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.30,** Concert relayed from **London. 8.0** (from **Danzig**), Concert by the Danzig Municipal Theatre Orchestra, conducted by Lenzer. Jubelouvertüre (Flotow); Scandinavian Folk Music (Hartmann); Prelude to the Second Act of Die Königskinder (Humperdinck); Kavalier-Walzer (Nedbal); Selection from La Bohème (Puccini); Overture, The Kiss (Smetana). **9.0,** News, Weather and Sports Notes. **9.15** (approx.), Political Press Review relayed from **Berlin (Deutschlandsender).**

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to **5.40 p.m.** and 20 kW from **5.40 p.m.** Programme of the General Broadcasting Society (A.V.R.O.).—**11.41 a.m.,** Concert by the Wireless Orchestra, conducted by Nico Treep: Overture, Light Cavalry (Suppé); Ballet égyptien (Luigini); Slav Dances Nos. 6 and 8 (Dvorák); Dance Suite from The Bartered Bride (Smetana); March, On the Quarter Deck (Alford); Gramophone Records; Splendour and Victory (Finck); Waltz, Hereinspaziert (Ziehrer); Spanish Legend (Rust); Rain and Shine (Krome); A Little Flirtation (Lautenschläger); Was kommt dort von der Höh (Suppé); Gramophone Records; A Japanese Carnival (de Basque); Selection from Le petit duc (Lecocq); Im schönen Tal der Isar (Löhr). **1.55,** Interval. **2.10,** Orchestral Concert (contd.): Marche solennelle (Tchaikovsky); A Summer Night in Madrid (Glinka); Selection from Turandot (Puccini). **2.40,** Dressmaking Lesson. **3.40,** Ballad Recital by Kaiser: Two Songs (Schubert): (a) Der Doppelgänger, (b) Heliopolis. Two Songs (Schumann): (a) In der Fremde, (b) Freisinn. Two Songs (Brahms): (a) Nachtwandler, (b) Die Mainacht. Two Songs (Hugo Wolf): (a) Der Freund, (b) Der Musikant. Two Songs (R. Strauss): (a) Traum durch die Dämmerung, (b) Heimliche Aufforderung. Two Songs (Koetsier): (a) Schluszstück, (b) Lob der Faulheit. **4.10,** Concert by a Children's Choir, conducted by Jacob Hamel. **4.40,** Programme for Children. **5.10,** Talk. **5.40,** Gramophone Music. **6.40,** Talk: The Stamp Collector. **6.55,** Gramophone Music. **7.10,** English Lesson. **7.40,** Time Signal and News. **7.45,** Talk on the Salvation Army. **8.0,** Concert of Light Music by Kovacs Lajos and his Orchestra. Interludes by the Fidelio Singers. **8.55,** Gramophone Music. **9.10,** French Song Recital by Yvette Guilbert. **9.30,** Concert by the Wireless Orchestra, conducted by Nico Treep. Soloist: Wilhelm Strienz (Baritone): Overture, The Italian Girl in Algiers (Rossini); Arias from (a) Don Carlos (Verdi), (b) Eugene Onegin (Tchaikovsky), (c) The Bartered Bride (Smetana); Hungarian Rhapsody No. 1 (Liszt); Songs from (a) Gasparone (Millöcker-Steffan), (b) Das Fürstenkind (Lehár), (c) Der Toni aus Wien (Steffan); Waltz, Dolores (Waldteufel); Overture, Le roi d'Yvetôt (Adam); Melody (Lincke). **10.40,** News. **10.50,** Concert of Light Music. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW from **3.40 p.m.** Programme of the Catholic Radio Society (K.R.O.).—**11.55 a.m.,** Concert by the K.R.O. Sextet: Im Zigeunerlager (Oscheit); Serenade. Il bacio (de Micheli); Waltz, Accelerationen (Jos. Strauss); Doubt (Glinka); Selection from Samson and Delilah (Saint-Saëns); Arabian Dance (Kruger); Gramophone Music; Bei der Zigeunerkapelle (Meyer-Helmund); Tarantelle brillante (Smith); Lehár Potpourri (Geiger); Barcarolle (Waldteufel); Russian Songs (Smith); Finale. **1.40 p.m.,** Programme for Women. **2.40,** Dressmaking Lesson. **3.40,** Interval. **3.55,** Gramophone Music. **4.10,** Concert by the K.R.O. Orchestra., conducted by Gerritsen: Selection from Die Königskinder (Humperdinck); The Mastersingers (Wagner); Lohengrin (Wagner). **4.30,** Tenor Song Recital by van den Berk: Selection from La Traviata (Verdi) and Rigoletto (Verdi). **4.40,** Orchestral Concert (contd.): Overture, Samson (Handel); Mother Goose Suite (Ravel). **5.0,** Song Recital (contd.): Lolita (Buzzi-Peccia); Zwei Märchen-Augen (Kálmán). **5.10,** Orchestral Concert (contd.): Selection from A basso porto (Spinelli); Extract from Schwanda the Piper (Weinberger); Selection from Boris Godunov (Mussorgsky); Rhapsody No. 14 (Liszt). **5.40,** Song Recital (contd.): Gern hab' ich die Frauen geküsst (Lehár); Das Zauberlied (Meyer-Helmund). **5.50,** Orchestral Concert (contd.): Johann Strauss Music; Overture, Eine Nacht in Venedig; Selection from Die Fledermaus; Wildfeuer Polka; Selection from The Gipsy Baron; Selection from Frühlingsluft. **6.20,** Esperanto Lesson. **6.40,** Police Notes. **6.55,** Literary Talk. **7.15,** Gramophone Music. **7.25,** Talk. **7.40,** Gramophone Music. **7.50,** News. **7.55,** Samson—Oratorio (Handel), by the Choir of the Catholic Oratorio Association, Amsterdam. Soloists: Urlus (Tenor), van Breemen (Soprano), Annie Woud (Contralto), and Funke Küpper (Bass). In an interval at **9.10,** Gramophone Music. **10.10,** News. **10.15,** Gramophone Music. **10.40,** Concert by the K.R.O. Boys, conducted by Lustenhouwer. **11.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

NICE, 1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Financial Report, Exchange and News. **8.10,** Agricultural Review. **8.20,** English Lesson. **8.35,** Concert. In the interval at **9.0,** Announcements and Weather.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.5 p.m.,** Programme from **Frankfurt. 12.25,** News and Weather. **12.35,** Concert from **Stuttgart. 2.0,** Violin and Harmonium Recital by Jakob Braun and Willi Jansen: Berceuse (Juon); Prelude (Kistler). **2.15,** Talk: Characteristics of the New German Traffic Policy. **2.30,** Economic Notes. **2.50,** Political Address. **3.0,** Musical Programme. Part I, Songs from an old Liederbuch. Part II, Dance Music by the Station Band, conducted by Kühn. Part III, Gramophone Records of the Cast of the Milan, Scala. **5.0 to 5.35,** See **Frankfurt. 5.50,** News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Dance Music by the Station Band, conducted by Kühn. In the intervals, Music for Old Instruments, by Rudi Rhein (Violin), Robert Grote (Viola de Gamba), and Hans Haass (Harpsichord). Concerto in E for Harpsichord, Violin, and Viola da Gamba (Telemann); Variations for Harpsichord and Viola da Gamba (Haydn). **8.0,** The German Village—Radio Sequence (Lützeler). **9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News, Weather, and Sports Notes. **9.45;** See **Stuttgart. 10.0,** Programme to be announced. **10.30.** See **Stuttgart. 11.0,** See **Frankfurt. 11.45** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—12.30 p.m.,** Music from New Operettas and Sound Films on Gramophone Records. **1.15,** News. **1.30,** Interval. **2.0,** Soprano, Flute and Pianoforte Recital. **2.35,** Market Prices. **3.0,** Dances of the Nations—Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber: German Dances (Schubert); Swedish Dances (Bruch); Norwegian Dances (Grieg); Viennese Dances (Beethoven); Russian Dance, Trepak (Tchaikovsky); Chinese Dance (Tchaikovsky); Slow Waltz, Loin du bal (Gillet); Hungarian Dances (Brahms); Romanian Dances (Béla Bartok); Spanish Dance, Bolero (Nicodé); Slav Dances (Dvorák); Dances from Gotland (Aulin); Icelandic Dances (Leifs); Piedmontese Dances in A (Sinigaglia). **4.30,** Books we are waiting for: Der Ritt nach Canossa (Otto Nebelthad). **5.0,** Talk: Chemicals as weapons of war: The Ostrogoths. **5.15** (from **Dresden**), Ballad Recital by Georg Zottmayr: Three Ballads (Loewe): (a) Heinrich der Vögler, (b) Der Nöck, (c) Odins Neeresritt; Drei Wanderer (Hermann). **5.40,** Market Prices and News. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10,** Jugens fahren ins Mittelalter (Boys return to the Middle Ages)—A Radio Scene, played by the Leipzig Hitler Jugend. **7.55,** Cabaret Programme. **8.25,** String Quartet in G. Op. 161 (Schubert), played by the Dresden String Quartet. **9.0,** News and Sports Notes. **10.0,** Programme to be announced. **10.30,** German Student Songs (on Gramophone Records). **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**6.0 p.m.,** French Lesson. **6.30,** Educational Talk. **7.0,** Guitar Duets. **7.40,** Duets. **8.30,** Time and News. **8.50,** Orchestral Concert. **9.30** till Close Down, I.B.C. Concert: My Wishing Song (Burke); Spanish Sweetheart (Hargreaves); Old Spotted Cow (Stanly); Flor de Cuba (Gregor); Then the Moon came out (Miller); Heaven will protect an Honest Girl (Weston); I lay me down to Sleep (Wrubel); When my Little Pomeranian (Little).

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—Belgian Evening. **7.0 p.m.,** Gramophone Concert: Symphony No. 6 in B flat Minor, Op. 74—the "Pathetic" (Tchaikovsky); Le chasseur maudit (César Franck). **8.0,** Song Recital by Bracony: Aria from L'Orontea (Cesti); Hans Sachs' Monologue from The Mastersingers (Wagner); Träume (Wagner); Clair de lune (Fauré); Hindou Song (Bemberg); Danse macabre (Saint-Saëns). **8.30,** Iberia Suite (Debussy) on Gramophone Records. **8.50,** News in French. **9.0,** Concert by the Station Orchestra, conducted by Henri Pensis, relayed from the Casino. Soloist: André Cassedanne (Violin). Overture, Prometheus (Beethoven); Concerto in A Minor for Violin and Orchestra (Dvorak). **9.45,** News in German. **9.55,** Concert (contd.): Prelude to The Mastersingers (Wagner); Pavane pour une Infante défunte (Ravel); Suite pour mes petits Amis (Pierné); The Witches' Sabbath (MacDowell); Nocturne (Grieg); The Flight of the Bumble Bee (Rimsky-Korsakov); Overture, Die Fledermaus (Joh. Strauss). **10.45,** Dance Music on Gramophone Records.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12 Midnight** till Close Down, I.B.C. Concert of Light Music: Tiptoe through the Tulips (Dubin); Now I am in Love (Shapira); Beautiful Spring (Lincke); An Old Blind Man (Castillo); Capullito de Albeli (Lecuona); Marta (Simons); Black-eyed Susan Brown (Hoffmann); Selection from The Count of Luxembourg (Lehár). **12.30 a.m. (Wednesday),** I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes. Exchange, Topical Talk and Dance Music. **7.30,** Talk by Joaquin España Cantos, Talk on Hygiene, and Dance Music (contd.). **8.15,** Radio Journal. **8.30 to 9.15,** Interval. **9.15,** English Lesson. **9.30,** Chimes, Time and Radio Journal. **9.45** (approx.), Music Competition—Suetas—Musical Play (Rebollo and Aquino). **11.45,** Radio Journal. **12 Midnight,** Chimes. **1.0 a.m. (Wednesday),** till Close, I.B.C. Concert of Dance Music: Oh Peter; Learn to Croon; Tunes from 1914-1930; Margie; Moonstruck; My Wishing Song; 'Twixt the Devil and the Deep Blue Sea; Under a Blanket of Blue; Wild Goose Chase; Love is the Thing; Selection from A Bedtime Story; Peter, Peter; Avalon; Scotch Hot; One Tiny Tear; I bring a Song. **2.0,** I.B.C. Good-night Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**6.0 p.m.,** See **Prague. 6.30,** See **Brno. 9.0,** See **Prague. 10.0** (approx.), Close Down.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres. 3.30 p.m.,** Concert from **Langenberg. 4.45,** The History of the Fichtelgebirge—Radio Report (Bayerl). **5.5,** The Great Gate of Kiev—Melodrama (Kühne-Hellmessen) set to Music from Mussorgsky's Pictures from an Exhibition. **5.25,** Talk: Max von Pettenkofer. **5.45,** Time, Weather and Agricultural Notes. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.15,** A Garland of Song—Lyric Play (Konrad Scherber) by the Station Orchestra, a Mixed Vocal Quartet and Soloists. **8.15,** Important New Gramophone Records. **9.0,** Time, Weather and Announcements.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy, LOL, 6,990 kc/s, 42.92 metres.—5.0 p.m.,** Programme for Housewives. **5.45,** Accordion Duet Recital of Popular Music and Dance Music, by Johannes Larsen and Ole Rönning. **6.0,** Announcements, Weather and News. **6.30,** English Lesson. **7.0,** Time Signal. **7.1,** Pièces en concert for 'Cello (Couperin), by Yrjö Arams Selin. **7.30,** Talk: The Excavations at Ur. **8.0,** Concert by the Station Orchestra, conducted by Kramm: Nada y Muche for String Orchestra, Trumpet, Guitar and Pianoforte (de

Arriaga); Festival Suite (Klass); Selection from Noel Coward's Cavalcade (arr. Jones); Selection from Les brigands (Offenbach); Suite from The Blue Mazurka (Lehár); Viennese Operetta Potpourri (Hruby). In the interval at 8.40, Weather and News, and at 9.0, Topical Talk.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Talk, Agricultural Notes and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Othello—Opera (Verdi) on Gramophone Records. In the intervals, Talk and Announcements. **10.0,** Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW.—Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.15,** Weather. **7.25,** News. **7.30,** Light Music on Gramophone Records. **7.45,** Art Notes. **8.0,** Science Talk. **8.15,** Political Review. **8.30,** On ne badine pas avec l'amour—Play (de Musset), with Music by Saint-Saëns.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music. **7.5,** Sponsored Programme. **7.15,** Le Journal Parlé. **7.30,** Gramophone Music. **8.0,** Talk on the Music Hall. **8.5,** Film Review. **8.15,** Concert by the Station Orchestra, conducted by Théodore Mathieu. **10.30,** News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Gymnastics. **7.30,** Weather and Gymnastics. **7.45,** Gramophone Music: Tango (Albeniz); Slav Dances (Dvorak); Polichinelle (Rachmaninov); Tambourin chinois (Kreisler). **8.0,** Press Review and Weather. **12 Noon,** Gramophone Concert: Part I—Ballet Music from Opera; Ballet Music from Faust (Gounod); Le Cid (Massenet), Samson and Delilah (Saint-Saëns), Prince Igor (Borodin) and Maroufe (Rabaud); Part II—Arias from French Operettas; Arias from Madame Favart (Offenbach), Madame l'Archiduc (Offenbach), La belle Hélène (Offenbach), La périchole (Offenbach), Les brigands (Offenbach), Les mousquetaires au couvent (Varney) and Ciboulette (Hahn). In the interval at **1.30 p.m.,** Exchange. **2.0,** Exchange. **3.45,** Exchange and Market Prices. **4.30,** Elementary English Lesson. **4.50,** Interval. **6.20,** Agricultural Talk. **6.40,** German Lesson. **7.0,** Theatre Review. **7.20,** Gramophone Music: Three Pieces (Debussy): (a) Hommage à M. Pickwick, (b) Minstrels, (c) General Lavine; Sur l' eau (Pedrell): La franc-comtoise (de Livry); Le bon roi Dagobert (Humble); Chants d' Auvergne (Canteloube). **7.45,** Review of the Anglo-Saxon Press. **8.0,** Radio Paris Music Hall: Part I—Items by Mme. Maud Gipsy (Diseuse); Part II—Duets by Edi and Jean. **8.40,** Review by Pierre Scize. **8.45,** Songs. **9.15,** Press Review and News. **9.30,** Music by Mayamba and his Black and White Band.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.,** Four Aces. **7.15,** Musical Originalities, from **New York.** **7.30, KDKA** Home Forum. **8.0,** Rochester Orchestra, from **New York.** **9.0, Betty and Bob,** from **New York.** **9.15,** Congress of Clubs. **9.30,** News and Market Reports. **9.45,** Brown Palace Orchestra, from **New York.** **10.15,** KDKA Kiddies' Klub. **10.30,** Singing Lady, from **New York.** **10.45,** Orphan Annie, from **New York.** **11.0,** News and Pat Haley. **11.15,** Sports and Programme Review. **11.30,** Evensong. **11.45,** Lowell Thomas, from **New York.** **12 Midnight, Amos 'n' Andy,** from **New York.** **12.15 a.m. (Wednesday),** Marvellous Melodies. **12.30,** Lois Miller, Organist. **12.45,** Programme to be announced. **1.0 to 2.30, New York** Relay. **1.0,** Crime Clues. **1.30,** Adventures in Health. **1.45,** Trade and Mark. **2.0,** Musical Memories. **2.30,** Programme to be announced. **3.0,** Ortiz Tirado, from **New York.**

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Bratislava.** **3.55,** Programme from **Brno.** **4.15,** Programme for Workers. **4.25,** Gramophone Records. **4.35,** German Conversation Lesson. **4.50,** Gramophone Music. **5.5,** Market Prices. **5.15,** Review of Events in Russia. **5.25,** News in German. **5.30,** German Transmission: Talk: Modern Viennese Poetry. **6.0,** Time, News and Weather. **6.10,** Talk: The Changing World. **6.30,** Concert by the Prague Wind Quintet. March from Figaro (Mozart); Overture, Le petit duc (Lecocq); Waltz (Chopin); Scherzo, Op. 4 (Fibich); Item to be announced); Polka (Splitek); Country Serenade (Kubin). **7.0,** See **Brno.** **9.0,** Time, News and Sports Notes. **9.15,** New Gramophone Records. **10.0** (approx.), Close Down

NOV. 28th TUESDAY *continued*

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Geneva**), Gramophone Concert. **12 Noon** (from **Geneva**), Financial Notes. **12.10 p.m.** (from **Geneva**), Gramophone Concert (contd.). **1.0,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0** (from **Lausanne**), Concert by the Small Radio Lausanne Orchestra, conducted by Moser. Part I: Chamber Music: First and Second Movements from the Trio, Op. 100, for Pianoforte, Violin and 'Cello (Schubert). Part II: Three Pieces for Strings: (a) Sailor Dance (Dunhill), (b) Pastoral Dance (Demuth), (c) Carillon (Pascal); Potpourri, Servus Wien (Dostal); Intermezzo (Ketelbey); Alpine Fête (Naef); Tarantella for Flute and Clarinet (Saint-Saëns); Selection from The Duchess of Chicago (Kalman). Part III: Folk Music. Part IV: Dance Music. **5.0** (from **Lausanne**), Programme for Women. **5.30** (from **Lausanne**), Talk: Victor Hugo. **5.55** (from **Lausanne**), German Lesson. **6.20** (from **Lausanne**), Theatre Talk. **6.45** (from **Lausanne**), Concert by the Small Radio Lausanne Orchestra, conducted by Moser. **7.30** (from **Lausanne**), L'ami Fritz—a Play in Three Acts (Erckmann-Chatrian). In the interval at **8.30** (approx.), News and Weather. **9.40** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.;** and **2RO, 11,810 kc/s, 25.4 metres.**—**12 Noon to 1.15 p.m.,** Trio Concert from **Turin.** In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.30,** Children's Radio Review. **3.55,** Giornale Radio and Exchange. **4.10,** Weather. **4.15 to 5.0,** Orchestral Concert; Sforzo mentale (Escobar); Scherzo (Adams); Immer glücklich (Künneke); Selection from I carnasciali (Laechetti); Dream Waltz (Ramoldi); Extracts from The Nutcracker Suite (Tchaikovsky); Happy Jazz (Borgato). **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Lesson in Morse and Dopolavoro Report. **6.0,** Tourist Report. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time and Announcements. **7.15,** Gramophone Music. **7.30,** Sports Notes. **7.45,** Variety Music. **8.30,** Dramatic Programme. **10.0,** Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres;** and by **W2XAD** on **19.56 metres.**—**12.45 a.m. (Wednesday),** Stock Reports. **1.0 to 3.45, New York** Relay. **1.0,** Popular Programme. **1.30,** Wayne King's Orchestra. **2.0,** Ben Bernie's Blue Ribbon Orchestra. **2.30,** Ed Wynn and the Fire Chief Orchestra. **3.0,** Lives at Stake. **3.30,** Variety Programme. **3.45,** Pianoforte Pals and Programme Resumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres, 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 a.m. to 6.5,** Gymnastics. **11.0** (from **Zürich**), Hints for Housewives. **11.5** (from **Zürich**), Light Music by the Station Orchestra, conducted by Neppach. **12.25 p.m.** (from **Zürich**), Time, Weather and Exchange. **2.30** from **Zürich**), Concert by the Small Station Orchestra, conducted by Scherbaum. **3.0,** See **Radio-Suisse Romande (Sottens). 5.0** (from **Berne**), Gramophone Concert. **5.30** (from **Berne**), Medical Talk. **6.0** (from **Berne**), Time, Weather, and Broadcast for Schools. **6.10** (from **Berne**), Talk: Unknown Ski-ing Grounds. **6.20** (from **Berne**), Radio Report. **6.50** (from **Berne**), Concert of Renaissance and Baroque Chamber Music by the Freiburg Trio. **7.30** (from **Berne**), Reading: Fairy Tales from Five Continents. **8.0,** Weather and News. **8.10** (from **Berne**), Scenes from Mozart's Life—Opera (Lortzing). **9.15** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**1.45 to 2.10 p.m.,** Broadcast for Schools. **4.5,** Play for Children. **4.45,** Gramophone Music. **5.45,** Elementary French Lesson. **6.15,** Weather and News. **6.30,** Talk: The Problem of International Debts. **7.0,** Concert by the Radio Orchestra, conducted by Nils Grevillius; Soloist, Fritjof Kjellberg (Pianoforte): Overture, Abencérages (Cherubini); Pianoforte Concerto in A (Mozart); Musette from Christian II (Sibelius); Ballet Suite (Reuss); Norwegian Rhapsody, No. 1 (Halvorsen). **8.15,** Literary Review. **8.45,** Weather and News. **9.0,** Song Recital by Magnus Strömbom. **9.15,** Concert by the Harman Mårtenssons Ensemble: Moment musical (Schubert); Liebesfeier (Weingartner); Selection from I Pagliacci (Leoncavallo); Piece (Merikanto); Minuet (Mayer); Serenade (Tosti); The Phantom Brigade (Myddleton); Popular Melodies (Kahrman). **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Gramophone Music. **12 Noon,** Orchestral Concert, conducted by Maurice de Villars: Overture, Il Seraglio (Mozart); Overture, Fidelio (Beethoven); Overture, Fingal's Cave (Mendelssohn); Overture, Manfred (Schumann); Overture, Phèdre (Massanet). **12.45 p.m.,** News, Time and Exchange. **1.5,** Concert (contd.): Ballet Music from Hamlet (Thomas); Suite for Orchestra, Bouton d'or (Pierné); Petite suite (Debussy); Bolero (Ravel). **2.0,** Interval. **4.45,** Talk in French: Cochin China. **5.0,** Concert of Light Music, conducted by Roskam: March, Les travaux d'Hercule (Terrasse); Waltz (Ziehrer); Promenade matinale (Lacombe); Overture, I love you (Fourdrain); Violin Solos: Ariette and Orientale (Erb); Selection from Monsieur Beaucaire (Messager); Two Pieces (Chaminade): (a) Sérénade d'automne, (b) Pierrette; Suite, Lanterne magique (Godard); March, L'esprit français (Messacapo). **6.0,** Talk on History. **6.15,** Topical Talk. **6.30,** Orchestral Concert, conducted by Maurice de Villers: Polonaise from Eugene Onegin (Tchaikovsky); Waltz Overture, The Barber of Seville (Rossini); Symphonic Poem, Phaëton (Saint-Saëns); Selection from The Pearl Fishers (Bizet); Ballet Music from Patrie (Paladilhe). **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German, Lottery Results and Announcements. **8.30,** See **Paris (Eiffel Tower). 10.30** (approx.), Press Review.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.25 p.m.,** Local News and Weather. **12.35,** Gramophone Records of the Otto Kermbach Orchestra. **1.30,** Talk on Flowers. **3.0,** See **Langenberg. 5.0,** See **Frankfurt. 5.35,** Agricultural Programme. **5.50,** Time and Weather. **6.0,** Transmission for all German Stations, relayed from **Berlin (Deutschlandsender). 7.0,** See **Berlin (Deutschlandsender). 7.10** See **Langenberg. 9.0,** See **Frankfurt. 9.20,** Things you should know. . . . **9.30,** Local News, Weather, and Sports Notes. **9.45,** Gramophone Music. **10.0,** Programme to be announced. **10.30,** Music by a Wind Band. **11.0,** See **Frankfurt. 11.45** (approx.). Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15,** Accordion Solos. **6.30,** Chansonnettes. **6.45,** Instrumental Solos. **7.0** Operetta Music. Arias from La petite dame du train bleu (Parès and Van Parys), Les mousquetaires au couvent (Varney), Louis XIV (Parès and Van Parys) and Les cloches de Corneville (Planquette). **7.15,** News. **7.30,** Symphonic Poem, Don Juan (R. Strauss), by the Symphony Orchestra. **7.45,** Songs. **8.0,** Organ Recital. Waltz, Gold and Silver (Lehár); Träumerei (Schumann); Finale from a Concerto (Handel); Plaisir champêtre. **8.15,** Opera Music. Arias from Lakmé (Delibes), Mignon (Thomas), Louise (Charpentier) and Mirella (Gounod). **8.30,** Orchestral Concert. Marche militaire No. 1 (Schubert): The Turkish Patrol (Michaelis); Petite Suite de Concert (Coleridge Taylor); Humoresque (Dvorak); Hindu Song (Rimsky-Korsakov); Minuet (Howells); Bourrée in B minor (Bach). **9.0,** Italian Songs. Cor mio mentre vi miro; Prologue to I Pagliacci (Leoncavallo); Neapolitan Song, Canta pe' me (de Curtis); Aria from Martha (Flotow); Aria from La Bohême (Puccini); T'amo; Potpourri of Italian Airs. **9.30,** Light Music. **9.45,** Music from Sound Films. **10.0,** Military Music. **10.15,** News. **10.30,** Concert for Listeners in Morocco. Part I. Opera Arias. Arias from Prince Igor (Borodin), Hamlet (Thomas) and Parsifal (Wagner). Part II. Light Music by a Viennese Orchestra. **11.0,** Chansonnettes. **11.15,** Dance Music. **12 Midnight,** News and Weather. **12.5 a.m. (Wednesday),** Music by an Argentine Band. **12.15,** Hunting-Horn Solos. Messe solennelle de St. Hubert (Blondiaux); La chasse française (Blondiaux). **12.30** (approx.). Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.,** Dance Music. **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Dopolavoro Announcements and Gramophone Music. **6.0,** Time, Report of the Royal Geographical Society and Gramophone Music. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** Announcements, Giornale Radio, Sports Review, Weather and Gramophone Music. **7.30,** Concert for the Ninth Anniversary of the Death of Puccini. Talk in the interval. **9.0,** Dance Music. **10.0,** Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning); and **5.969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in English. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: March, Wiener-Hallo (Recktenwald); Overture, Baron Trenck (Albini); Selection from Faust (Gounod); Sérénade florentine (Godard); Waltz, Myrtenblüten (Joh. Strauss); Song, Mädel, die Stunde der Liebe ist da (Schubert-Berté); Das Herz des Pierrot (Clemus); Extase (Ganne). **12 Noon,** Time. Weather and Programme Announcements. **12.10 p.m.,** Concert (contd.): March, Fesch und schneidig (Rameis); Overture, Frau Luna (Lincke); Two Songs (Granichstaedten): (a) Zuschau'n kann i net, (b) Wann die Musik spielt; Waltz, Die letzten Tropfen (Kratzl); Poème orientale (Werba); Intermezzo, Amoretten (Schmeling); Song, Märchen, die der Wind erzählt (Silving); Selection from Zigeunerprimas (Kálmán). **1.0 to 2.0,** Interval. **2.0,** Time and Announcements. **2.15,** Programme for Children. **2.55,** Gramophone Concert of German Opera Music: Overture, The Merry Wives of Windsor (Nicolai); Aria from Der Freischütz (Weber); Selection from Siegfried (Wagner); Finale from the Second Act of Der Rosenkavalier (Richard Strauss). **3.25,** Guessing Competition. **3.55,** Talk: The Works of the Old Dutch Painters. **4.20,** Song and Violin Recital by Maria Deri-Spitzmüller (Soprano) and Wilhelm Müller: Sonata in B Flat for Violin and Pianoforte (Mozart); Songs (Richard Strauss): (a) Freundliche Vision, (b) Ständchen; Song, Hat dich die Liebe berührt (Marx); Song, Abend atmet aus den Blütenzweigen (Max Ast); Song from Die tote Stadt (Korngold). **5.0,** Talk: Dantan's Caricatures. **5.15,** Talk: Man and Industry. **5.40,** Elementary French Lesson. **6.0,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. Soloist: Mimi Brix (Soprano). Overture, Light Cavalry (Suppé); Song from Die Landstreicher (Ziehrer); Gavotte from Der Rastelbinder (Lehár); Overture to and Songs from Herbstmanöver (Kálmán); March, Die Bosniaken kommen (Wagnes); Waltz, Schwert und Leier (Joh. Strauss); Song, Die Musik kommt (Oscar Straus); Song, Adieu, mein kleiner Gardeoffizier (Stolz); Potpourri, Der Traum eines Reservisten (Ziehrer). In the interval at **6.35,** Time and Announcements. **7.15,** Topical Talk. **7.30,** Concert from **London. 8.30,** News. **8.45,** Talk in Italian: Austria in Winter. **8.55,** Concert relayed from the Hotel Krantz Ambassador. Announcements after the Programme.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5,** Sextet Concert: La Paloma (Yradier); Melody (Fucik); Trio (Romberg); Selection from Viktoria and her Hussar (Abraham); Melody (Rubinstein); Romantic Waltz (Heinecke); Melody (Tosti); Intermezzo (Chapuis). In an interval at **11.30,** Radio Journal and Weather. **12 Noon,** Interval. **2.25,** Announcements. **2.30,** Economic Notes. **2.40,** Light Music on Gramophone Records. **3.25,** Savings Bank Correspondence. **3.40,** Book Review. **3.55,** Song Recital by Mme. Duducz: Song of the Golden Fish (Friemann); Invito alla danza (Respighi); Wiegenlied (Reger); Aria from Goplana (Zelenski); Hymn to the Sun from The Golden Cockerel (Rimsky-Korsakov); Aria from La Zingara (Donizetti); Neopolitan Tarantella (Rossini). **4.25,** Talk: Making a Book, relayed from **Wilno, 530 kc/s, 566 metres. 4.50,** Agricultural Notes. **5.0,** Talk: The Keys of Power and of Knowledge. **5.20,** Pianoforte Trio in D minor, Op. 32 (Arensky). **6.0,** Programme Announcements. **6.5,** Miscellaneous Items. **6.25,** Topical Talk. **6.40,** Sports Notes. **6.47,** Radio Journal. **7.0,** Fatinitza—Operetta in Three Acts (Suppé). In the interval, Reading. **10.0,** Weather and Police Notes. **10.5,** Dance Music from the Oaza.

ZURICH—See **Schweizerischer Landessender.**

WEDNESDAY
NOVEMBER THE TWENTY-NINTH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.0 p.m.,** Financial Notes. **7.10,** Shipping Notes. **7.15,** Agricultural Notes and Weather Report. **7.20,** Songs from Sound Films. **7.55,** News. **8.0,** Time Signal. **8.2,** Lottery Results. **8.10,** Concert by the Station Orchestra, conducted by Defosse. Overture, Patrie (Bizet); Divertissement sur des chants russes (Rabaud); Suite from L'Arlésienne (Bizet); Spanish Caprice (Rimsky-Korsakov); Prelude to the Third Act of Lohengrin (Wagner). In the interval at **9.0,** Gramophone Music. **9.40,** News. **9.45,** Music by an Argentine Band. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW.—Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gaelic Talk. **7.15,** German Lesson. **7.30,** Time Signal. **7.31,** Concert by the Station Orchestra. **8.0,** Vocal Duets by P. J. Byrne and W. J. Hobbs. **8.20,** Florrie to the Rescue—a Play, by Mai Neville and Company. **8.50,** Gaelic Song Recital by Dennis Cox. **9.5,** The Station Orchestra. **9.15,** Contralto Solos by Nora Finn. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert. Dance Music. In the Park in Paree; Adois Juventud; Niagara Moon; What have we got to Lose? **9.45,** Broadcast of Dance Music. Signature Tune: There's a New Day Coming; I've got to sing a Torch Song; Waltzing alone with You; Oh, Johanna; Morning, Noon and Night; Signature Tune; There's a New Day Comin'. **10.0,** Orchestral Concert arranged by the International Broadcasting Company (Ireland), Ltd. Humoresque (Dvorak); Song: Walther's Prize Song (Wagner); La Cinquantaine (Gabriel Marie); Racing Commentary; Down in the Forest (Landon Ronald); The Flower Song from Carmen (Bizet); Minuet (Mozart); Ballet égyptien (Luigini). **10.30,** I.B.C. Good-night Melody, followed by News and Weather. **10.40,** Irish Music by the Moate Ceilidhe Band. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 249.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert Selection from Fidelio (Beethoven); Piece (Mendelssohn); The Butterfly Chase (Leopold); Romance (Rubinstein); Intermezzo (Haurcgard); Serenade (Vallaury and Weber); Selection from Le roi de Lahore (Massenet). **7.0,** Request Gramophone Music. **7.30,** Exchange, Gramophone Music and Relay from the Ayuntamiento. **8.0,** Gramophone Music. **8.30,** Educational Programme: Geography and History Lesson. **9.0,** Chimes, Weather, Exchange and Market Prices. **9.5,** Concert by the Radio Orchestra. **10.0,** Song Recital by Enriqueta Noguera. **10.30,** Quartet, Op. 7 (Novak). **11.0,** News and Gramophone Music. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Children. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15,** See **Turin. 7.30** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**6.0 p.m.,** Gramophone Music. **6.30,** Opera Arias by Milorad Jovanovic. **7.0,** Relay of an Opera from **Ljubljana. 9.0,** Time and News. **9.15** (approx.), Gramophone Music. **9.40** Cigány Music, relayed from the Kasina Restaurant.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**12.45 p.m.,** News. **1.0,** Gramophone Concert: Draussen in der Welt (Borgmann-Buder); Am Wörther See (Koschat); Tyrolese Folk Melody; Air from Carmen (Bizet); Spanish Romance (Strauss); Manzanilla (Sjegel); This is Madrid (O'Henry); Melody (Yoshitomo); Cherry Blossom Festival (Dicker); Sunset in Japan (Deppen); Oriental Dance (Glazunov); Hindu Song (Rimsky-Korsakov); Puszta-Grüsse (Kiss-Béla); Heinrich am Rhein (Doelle). **1.45,** Programme for Children, followed by Talk: The Prevention of Cruelty to Animals. **2.10,** Talk for Girls. **2.30,** Weather and Exchange. **2.45,** Talk: The History of Flying—The Story of the Schneiders. **3.0,** Concert, relayed from **Hamburg. 4.0,** Books for Young People. **4.25,** Modern Chamber Music for Five Wind Instruments, by the Wind Instrument Ensemble of the Berlin Philharmonic Orchestra: Quintet for Flute, Oboe, Clarinet, Horn and Bassoon (Klughardt); Serenade, Op. 34 (Blumer). **5.0,** Poems. **5.5,** Religious Address and Organ Solos. **5.30,** German for Germans. **5.50,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.0,** Today's motto. **7.5,** Adventurous Travels—a Radio Sequence (Alfred Prugel). **8.10,** Request Concert on Gramophone Records. **9.0,** Weather, News and Sports Notes. **9.30,** Technical Wireless Talk. **9.45,** Weather. **10.0,** See **Munich. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB** and **DJE.—2.20 to 3.30 p.m.,** Programme for Women. **2.20,** Talk: The Children's Nursery. **2.35,** Elsa Oettingen Song Recital by Hete Mex (Soprano), accompanied by the Composer. **2.45,** A Dialogue. **2.55,** Extracts from the Wohltemperiertes Klavier (Bach) by Wilhelm Kempff (Pianoforte) on Gramophone Records: (a) Prelude and Fugue in D, (b) Prelude and Fugue in C Sharp. **3.10,** Reading from the Letters of Nonne Marianna Alcoforado. **3.30,** Orchestral Concert relayed from the Haus Vaterland. **4.45,** A Radio Sequence. **5.5,** See **Berlin (Deutschlandsender). 5.30,** The Funkstunde informs its Listeners. . . . **5.45,** Topical Talk. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.5,** Concert by the Station Orchestra, conducted by Helmar Kähler: Overture, Im Herbst (Grieg); Symphonic Poem, Op. 41, Karpathen (Bader); Tanz unter der Dorflinde, Op. 161 (Reinecke); Serenade, Op. 48 (von Franckenstein). **8.0,** Recital of Folk Songs. **8.20,** Violin Concerto, Op. 35 (Tchaikovsky), by Erich Röhn and the Station Orchestra, conducted by Hans von Benda. **9.0,** News and Sports Notes. **9.30,** Gramophone Concert of Operetta Music: Overture, Der lustige Krieg (Joh. Strauss); Air from The Czarevitch (Lehár); Air from The Geisha (Jones); Wenn zwei sich lieben from Der Rastelbinder (Lehár); Tenor Aria from Don Cesar (Dellinger); Duet from the Gipsy Baron (Joh. Strauss); Selection from Liselott (Künnecke). **10.0,** Variety Programme relayed from the Open-Air Theatre at Gross-Glienicker See (on Gramophone Records). **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News. **7.40,** Talk on Films. **7.55,** Lottery Results. **8.0,** Agricultural Programme. **8.15,** News. **8.30,** Concert of Light Music.

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**4.55 p.m.,** Programme for Hungarian Listeners: Part I—Talk and Reading; Part II—Recital of Songs and Arias by Sagi Margit: Songs by Liszt, Zador and Stradella: Arias from Carmen (Bizet), Hérodiade (Massenet), Cavalleria rusticana (Mascagni), Samson and Delilah (Saint-Saëns) and Tosca (Puccini). **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.40,** Recital of Jan Levoslav Bella Songs for the Composer's Ninetieth Birthday. **7.0,** See **Prague. 9.15** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—11.0 a.m.,** Weather. **11.5,** Concert by the Silesian Philharmonic Orchestra, conducted by Gerhard Rischka: Overture, The Thieving Magpie (Rossini); Selection from Das Christelflein (Pfitzner); Suite (Atterberg); German Dances (Ursprung); Overture, Banditenstreiche (Suppé); Waltz, Op. 59, No. 2 (Schütt); Italian Suite (Kostal); Musikalische Dorfgeschichten (Kretschmer); Slow Waltz (Montey); March. In an interval at **12.45 p.m.,** Time, News and Exchange. **1.40,** Programme arranged by the Post Office with Gramophone Records. **1.55,** Agricultural Prices. **2.10,** Talk: The Call of the Mountains. **2.30,** Talk for Parents. **3.0,** Orchestral Concert: Overture, Il Seraglio (Mozart); Waltz, Die Hydropathen (Gungl); Serenade, On Lake Maggiore (Heusser); Selection from The Serenade (Herbert); Intermezzo, Im Märchenwald (Rönnfeldt); Potpourri, Diamanten und Perlen (Dostal); March (Maurer). **3.50,** Talk: An Upper Silesian Labour Service Camp. **4.10,** Agricultural Prices. **4.15** (approx.), Concert (contd.): March Sturmglocken (Freitag); Overture to an Operetta (Lincke); Selection from Wiener Blut (Joh. Strauss); Ein Schäferstündchen (Siede); Potpourri, Waldteufel-Reigen (Weninger); Ully (Lark); Masquerade (Lindner). **5.0,** Talk: Changing Names. **5.15,** Radio Report from a Factory for Explosives. **5.40,** Programme Announcements and Meat Market Prices. **6.0,** Transmission for all German Stations, relayed from **Frankfurt. 7.0,** News. **7.10,** Dance Music from the Südpark-Restaurant. **8.10,** Die Buxt ei derr Hilbichmühle—A Humorous Radio Play in Dialect (Schenke), with Music by Sczuka. **9.10,** Time and News. **9.35,** Gramophone Concert. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News, Talk on Gerhardt Hauptmann and Thomas Mann, and Talk for Workers. **6.0,** See **Prague. 6.40,** A Lyric Play (Jichová). **7.5,** See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Records Acts I and II of Manon (Massenet). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Max Alexys Orchestra. **5.0,** Concert by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp. **6.0,** Talk: The Origin of Life and of the World. **6.15,** Gramophone Concert: Selection from Shulamith (Goldfaden); Träumerei (Schumann-Weiner); Selection from Lilac Time (Schubert-Berté); O sole mio (di Capua); Selection from Peter Pan (Crook). **6.45,** O'inventeur—Sketch (Lanville). **7.0,** Gramophone Music: Melody (Tchaikovsky); Impressions d'Italie (Charpentier). **7.30,** Medical Talk. **8.0,** Musical and Literary Programme: Pianoforte Solo: Gaspard de la nuit (Ravel), by Carles Scharrès; Reading of Poems (Aloysins Bertrand), by Germaine la Vallee. **8.45,** Song Recital by Yvette Guilbert. **9.30,** Concert by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp. **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Orchestral Concert. **1.0 p.m.,** Le Journal Parlé. **1.10,** Gramophone Concert: Selection from The Gold-Diggers of 1933 (Warren); Les échos d'Alsace (Ruegoy); Waltzes (Romberg); Farewell to Naples (Cottran); Selection from Princess Charming (Sirmay); Italian Fantasia (Delmas); Selection from Sunny (Kern). **5.0,** Symphonic concertante for Violin and Viola (Mozart), on Gramophone Records. **5.30,** Concert by the Radio Orchestra, conducted by Charles Walpot, with Commentary: Overture, Cigale et Magali (Casadesus); Two Lyric Rhapsodies (Coates); Musiquette for Pianoforte and Orchestra (Poot); Waltz for Two Saxophones (Brahms); Serenade for Vibraphone and Orchestra (Saint-Saëns). **6.15,** Talk: Pioneers of Free Thought in Belgium. **6.30,** Concert (contd.): Rhapsody in Blue (Gershwin); Nocturne for Saxophone (Chopin); Suite, Four Ways (Coates). **7.30,** Horticultural Review. **8.0,** Béatrijs—A Musical Miracle Play (Veremans). In the interval, Recitation. After the Programme, Le Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—**4.0 p.m.,** Popular Romanian Music by the Fanica Luca Orchestra. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0 to 8.45,** Polish Programme. **7.0,** Talk on Poland. **7.20,** Concert by the Station Orchestra: A Lithuanian Rhapsody (Karlowicz); Elegy (Moniuszko); Valse brillante (Chopin). **7.50,** Recital of Polish Poetry. **8.0,** Recital of Polish Songs by Dora Massini. **8.20,** Sonata for Pianoforte and Violin (Szymanowski), by Alfred Alessandresco and Alexandre Theodoresco. **8.45,** Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **6.30 p.m.** till Close Down.—**4.30 p.m.,** Concert. **5.0,** Italian Lesson. **5.25,** Gramophone Music. **6.30,** Der Dichter—Play in Three Acts from the Life of Karl Kisfaludy (Michael Boross). **8.15,** News. **8.30,** Concert of Cigány Music from the Café Baross. **9.30,** Concert. **10.15,** Dance Music from the Café Baross.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres,** and **Skamlebaek, OXY, 49.4 metres.—11.45 to 1.0 p.m.,** String Ensemble Concert, relayed from the Bellevue Strandhotel. **1.30,** Programme for Women. **2.0,** Concert by the Teddy Petersen Orchestra, relayed from the Wivex Restaurant. **4.0,** Gramophone Music. **4.30,** Exchange and Fish Market Prices. **4.45,** Medical Talk. **5.15,** French Lesson. **5.45,** Weather and Announcements. **6.0,** News. **6.15,** Time. **6.30,** Review of Important Events of November. **7.0,** Chimes from the Town Hall. **7.5** Fall Concert by the Radio Orchestra, conducted by Emil Reesen: March and Waltz from The Dollar Princess; Selection from The Rose of Stamboul; Brüderlein fein; Selection from Roses from Florida. **7.45,** Talk. **8.15,** Scheibe Harpsichord Recital by Fulmer Jensen: Sonata No. 1 in C; Sonata No. 2 in G. **8.35,** Reading (Sosnlja). **9.0,** News. **9.15,** Concert by the Radio Orchestra, conducted by Emil Reesen: In the Steppes of Central Asia (Borodin); Orientale (Cui); Spanish Serenade (Glazunov); Arab Melody (Glazunov); Piedmontese Folk Dance No. 1 (Sinigaglia); Gopak (Mussorgsky); Extract from the Japanese Suite (Holst). **10.0,** Dance Music, relayed from Nimb's Restaurant. In the interval at **11.0,** Time and Chimes from the Town Hall. **11.30** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m.** till **12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Request Music: Signature Tune; Hand me down my Walking Cane; Rhapsody in Blue (Gershwin); Bless this House (Taylor); Polonaise in A (Chopin); Song of the Nightingale (Ailhont); Vilikins and his Dinah (Traditional); You've got me crying again (Newman); Sweetheart Darlin' (Kahn); Everything that's nice; Minnie the Moocher; Mary Jane; Just a Little Smile; Ho Hum; Wear a Great Big Smile (Gilbert); I'll see you in the Morning (Fields); Dance Pretty Lady (Strauss); Signature Tune. **12 Noon,** Programme in French. **3.30 to 6.0 p.m.,** Programme in English by the I.B.C. **3.30,** Hawaiian Band: Tango des Roses (Scherler); Naughty Hawaii (Carlo); Hawaiian Waltzes; Caramia (Brodsky); Aloha Oe (Liliuokalani); Maui Girl (Libornia); La Rosita (Dupont); My South Sea Home (Camillio). **4.0,** Dance Music: Signature Tune, The Bells of Normandy; Lay your Head on my Shoulder; Dinner at Eight; Moths around the Candle Flame; Mon amour; Gipsy sing for me; Everyone loves my Marguerite; Tick, Tock; Isn't this a Night for Love; Signature Tune, The Bells of Normandy. **4.30,** The I.B.C. Nursery Corner Birthday Greetings; Trumpets. **4.40,** Orchestral Concert for Isle of Wight Listeners: Signature Tune, The Night by the Sea; Waltz Medley (arr. Simpkin); The Coon among the Chickens (Ives); Pianoforte Solo: Hollyhock (Mayerl); Sizilietta (Blon); Love and Life in Vienna (Renard); Her first Dance (Heykens); The Busy Bee (Bendix); The Futuristic Rag (Bloom); Vocal: Forty-Second Street (Dubin); Memories of Paris (Christine). **5.20,** Portsmouth and Southsea Concert of Military Music: Trumpets; Down South (Myddleton); Selection from The Miracle (Humperdinck); The Hunt in the Black Forest (Eilenberg); The Skaters' Waltz (Waldteufel); Song, Invictus (Huhn); March (Mohr); The Mad Major (Alford); Cornet Solo: Carnival of Venice (Briccialdi); Ständchen (Heykens); In a Persian Market (Ketelbey); The Doge's March (Rosse); Signature Tune. **6.0,** Programme in French. **10.0** (approx.) till Close Down. Programme in English by the I.B.C. **10.0,** Light Music: Out of Breath; Song, Castles in the Sand (Sandford); Pianoforte Solo: The Birth of the Blues (Henderson); Egyptian Serenade, Amina (Lincke); Song, Don't be late in the Morning (Le Clercq); Sweetheart I'm dreaming of you (Desmond); Song, Sundown in a Little Green Hollow (Baskette; Romance (Lohr). **10.30,** Dance Music: Signature Tune, The Bells of Normandy; Let the World go drifting by; P.C. 123; Love Songs of the Nile; Who's Afraid of the Big Bad Wolf; Ah! but it's Love; Sweetheart Darlin'; From me to you; Sweep; Signature Tune, The Bells of Normandy. **11.0,** Talkie Time. Tunes from the Talkies and Shows: Signature Tune, Sittin' in the Dark; Selection from The Kid from Spain (Kalmar); Sweep (Ellis); In a Year, in a Day (Heymann); Peter (Hollander); A Couple of Fools in Love (Valentine); Selection from Il est charmant (Moretti); Why has a Cow got Four Legs? (Ellis); Dancing on the Ceiling (Hart); Signature Tune. **11.30,** Club Concert for Llanwrytd Wells Listeners. Part I, Orchestral Concert: Signature Tune, The Chum Song, Musical Comedy Switch (arr. Hall); Ideale (Tosti); March of the Men of Harlech; Pizzicato from Sylvia (Delibes); Artist's Life (Joh. Strauss); Cavatina (Raff); Cymru Fyss (Perry); Air de Ballet (Herbert). **12.5 a.m. (Thursday),** Late News Bulletin in English. **12.10** (approx.), Club Concert, Part II: Stay out of my Dreams (Washington); The Wedding of Mr. Mickey Mouse (Pola); The Last Round Up (Hill); Lover (Rodgers); The Three Trees (Powell); Signature Tune. **12.30,** Dance Music: Signature Tune, The Bells of Normandy; I've got to sing a Torch Song; My Moonlight Madonna; Nunca; About this Time next Week; A couple of Fools in Love; Well Done Gordon; I'm getting Sentimental over you; For Love Time. **1.0,** Dance Music: Smoke Rings; Nina; Goofus; I've got to get up to go to Work; If you'll say "Yes" Chéric; Oh, Johanna; My Own; Love in the Moonlight; A couple of Pals; Conchita; It's the Talk of the Town; Isn't it Heavenly; Ding, Dong, Ding; Lazybones; Nobody's Sweetheart; Out in the Open; Signature Tune, The Bells of Normandy. **2.0,** I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

NOV. 29th **WEDNESDAY** *continued*

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.**, Time and News. **12.25**, Local News and Weather. **12.35**, See **Stuttgart.** **1.30**, A Radio Play for Children. **2.30**, Weather Forecast. **2.40**, Time and Market Prices. **3.0 to 5.35**, See **Langenberg.** **5.35**, Topical Programme. **5.50**, Weather, News and Time. **6.0**, Transmission for all German Stations: Florestan and Eusebius—The Struggle of the Davidsbünder for Art against the Philistines; Musical Radio Sequence after Schumann. **7.0**, Topical Programme. **7.10**, See **Stuttgart.** **9.0**, Time and News. **9.20**, See **Stuttgart.** **9.30**, Local News and Weather. **9.45**, Gramophone Concert. **10.0**, Scenes from Mozart's Life—Play in One Act, with Music by Mozart, arranged by Lortzing. **11.0**, Concert. **12 Midnight**, Close Down.

FREDERIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg,** and **Hanover, 1,319 kc/s, 227.4 metres**; and **Kiel, 1,292 kc/s, 232.2 metres.**—**3.0 p.m.**, Concert by the Small Station Orchestra, conducted by Adolf Secker. Overture, Rosamunde (Schubert); Consolation No. 2 (Liszt); Suite, No. 1 from L'Arlésienne (Bizet); Overture, Prince Igor (Borodin); Selection from Die toten Augen (d'Albert); Entry of the Boyards (Halvorsen). **4.0** (from **Kiel**), The Actress—Play (Friedrich von Hebbel). **4.30**, Gramophone Records for Children. **4.50**, A Humorous Radio Sequence for Children (Walter Gättke), with Songs to the Lute by Richard Germer. **5.40**, Frankfurt Exchange and Hamburg Market Prices. **5.50**, Weather. **6.0**, Transmission for all German Stations, relayed from **Frankfurt.** **7.0**, The Magic Cabinet—A Musical Play for Radio (Walter Hapke). **9.0**, Time and News. **9.20**, Orchestral Concert, relayed from the Reichshof. **10.10**, Relay of a Concert.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**12.5 p.m.**, German Rivers—Gramophone Concert: An der Weser (Pressel); Moonlight on the Danube (Gay); Am Rhein (Overzier); Moonlight on the Alster (Fetras); Moselweinlied (Korn); Herrgott, am blühenden Neckarstrand (May); Am Koblenzer Eck (Czernik); Alt Marburg an der Drau (Frank); Denn im blühenden, lachenden Moseltal (Spies); An der schönen grünen Isar (Freundorfer). In the intervals at **12.20** and **1.0**, News. **1.10**, Concert by a Trombone Ensemble: Wachet auf, ruft uns die Stimme (arr. Praetorius); Nun lob mein Seel den Herrn (Kugelmann); Folk Song, In stiller Nacht zur ersten Wacht; Treue Liebe bis zum Grabe (Handel); Folk Song, Ich fahr dahin; O du mein Trost und süsses Hoffen (Frank); Macht hoch die Tür die Tor macht weit (Halle). **1.30** (approx.), Programme arranged by the Post Office with Gramophone Records. **2.0**, Agricultural Prices and Exchange. **2.20**, Hints for the Housewife. **3.0**, Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner: Selection from L'isola disabitata (Haydn); The Brandenberg Concerto No. 3 in G (Bach); German Folk Song Fantasia (Blumer); Spielmusik (Weiss); Four Old Dances (Niemann); Overture, L'amore medico (Wolf-Ferrari). **4.30** (from **Danzig**), Talk. **4.50**, Review of Periodicals. **5.15**, Agricultural Prices. **5.25**, Talk: The Art of Pianoforte Playing, with Illustrations from the Music of Brahms. **5.50**, Weather. **6.0**, Transmission from all German Stations, relayed from **Frankfurt.** **7.0**, News. **7.10**, Dance Music by the Small Station Orchestra, conducted by Eugen Wilcken. **9.0**, News. **9.15** (approx.), Concert. **11.0** (approx.), Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.**; and 20 kW from **5.40 p.m.**—**11.40 a.m.** till Close Down. Programme of the Workers' Radio Society (V.A.R.A.). **11.40**, Concert by the Small V.A.R.A. Orchestra, conducted by de Groot: Marche des gamins de Paris (Berger); Rêve (d'Ambrosio); Lolita (Buzzi-Peccia); Serenade (Jensen); Melody (Rubinstein); Chanson d'automne (Tchaikovsky); Motor March (Roscy); Gramophone Records: Marche russe (Ganne); Valse triste (Berger); Patrouille lointaine (Gillet); Ständchen (Schubert); Three O'clock in the Morning (Robledo); Vienna, City of my Dreams (Sieczynski); Petite marche viennoise (Kreisler); Gramophone Records: Le Jongleur (Roscy); Waltz, Op. 54, No. 1 (Dvorak); Serenade (Pierné); The Holy City (Adams); Troika (Steinberg); Si j'étais jardinier (Chaminade); Rêve angélique (Rubinstein); Los banderillos (Volpatti). **1.40 p.m.**, Interval. **1.55**, Dressmaking Lesson. **2.40**, Programme for Children. **5.40**, Concert by the V.A.R.A. Orchestra, conducted by de Groot: Overture, Nakiris Hochzeit (Lincke); Waltz (Nedbal); Chinese Tea-House (Bortz); Viennese Waltz (Benatzky); Ein Souper bei Suppé (Morena). **6.10**, Talk: The League of Nations. **6.40**, Talk. **7.0**, Concert of Light Music. **7.20**, Recitation. **7.40**, SOS Announcements. **7.42**, Concert by the V.A.R.A. Orchestra, conducted by de Groot: Kamarinskaya (Glinka); Hymn to the Sun (Rimsky-Korsakov); Five Russian Dances (Bortkiewicz); Chanson triste (Tchaikovsky); Extract from the Sleeping Beauty (Tchaikovsky). **8.30**, News and Announcements. **8.40**, Orchestral Concert, conducted by Ruygrok: Soloists: Nelles (Songs) and Stotijn (Oboe); The Pathetic Symphony (Tchaikovsky); Five Songs; Overture, The Hebrides (Mendelssohn); Oboe Concerto (Haydn); Three Songs; Romeo and Juliet (Tchaikovsky). **10.40**, Organ Recital by Jong; Selection from The Geisha (Jones); Dancing Butterflies (Petkere); Melody (Delettre); The Wedding of the Dragonflies (Reaves). **11.10**, Gramophone Records. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.**—**11.55 a.m.** till Close Down. Programme of the Christian Radio Society (N.C.R.V.). **11.55**, Gramophone Music. **12.10 p.m.**, Concert by the Van de Horst Trio and Mme. Ravenzwaay-Möllenkamp (Songs); Trio in A Minor (Buxtehude); Three Pieces (J. W. Franck): (a) Welt ist Welt, (b) Gebet um Seelenfrieden, (c) Lebenstrost; Bundeslied (Mozart), Im Frühling (Mozart), Aria from Alcina (Handel); Aria from Figaro (Mozart); Aria from Iphigenia in Aulis (Gluck); Gramophone Records: Gebet vor der Schlacht (Weber); Pilgerspruch (Mendelssohn); Chanson triste (Tchaikovsky); Een lied (Weiss); Herfst (de Cocq); Gelderland Folk Song (Rombout v. Riemsdyk); Aan Brabant (Maassen); Kind van Holland (Moolenaar); Holder Friede (Romberg); La musica proibita (Gastaldon). **1.40**, Gramophone Music. **2.10**, Talk for Women. **2.40**, Religious Talk. **3.10**, Gramophone Music. **3.25 to 3.40**, Interval. **3.40**, Organ Recital by Kloek: Legend, Op. 6, No. 1 (Melartin); Sous les branches, Op. 16, No. 1 (Lazzari); Marche Sainte (Massenet); Au matin, Op. 43 (Godard); Au couvent (Borodin); Am Genfer See, Op. 139 (Bendel). **4.40**, Programme for Children. **5.40**, Agricultural Talk. **6.10**, Programme to be announced. **6.40**, Police Notes. **6.55**, Religious News. **7.10**, Talk on Russia. **7.40**, Divine Service, relayed from the Baptist Church in Hengelo. **9.10**, News. **9.20**, Organ Recital by Zwart. **10.20**, Gramophone Music. **11.10** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.**, Amusement Guide, Financial Report, Exchange and News. **8.10**, Concert. In the Interval at **9.0**, Announcements and Weather.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.**, News and Weather. **12.35**, Concert from **Stuttgart.** **1.30**, See **Frankfurt.** **2.30**, Market Prices. **2.50**, Political Announcements. **3.0**, Concert. Part I. Dance Music. Part II. Humorous Programme. Part III. Choral and Orchestral Music. **5.0**, German for Germans. **5.20**, Talk on Race Origins. **5.35**, Report on Research Work and Science, with Musical Interludes. **5.50**, Announcements. **6.0**, Transmission for all German Stations, relayed from **Frankfurt.** **7.0**, See **Frankfurt.** **7.10**, See **Stuttgart.** **9.0**, See **Frankfurt.** **9.20**, See **Stuttgart.** **9.30**, News and Sports Report. **9.45**, See **Frankfurt.** **11.0**, Concert. **12 Midnight**, Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**11.0 a.m.**, Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber. Overture, The Magic Flute (Mozart); Ballet Music from Anacreon (Cherubini); Selection from Le Postillon de Lonjumeau (Adam); Andante, and Humoresque from the Suite, At Carnival Time (Georg Schumann); Extract from The Damnation of Faust (Berlioz); Overture, Edelweiss (Komzak); Selection from La Dame blanche (Boieldieu); Isa-Walzer (Gfaller); Selection from Der Sterngucker (Lehár). In the interval at **12.15 p.m.**, News and Programme Announcements. **1.15, to 1.30**, News. **2.0**, Gramophone Music. **2.35**, Market Prices. **3.0**, Recital of Folk Songs by a Students' Choir. **4.0**, Book Review. **4.20**, Topical Programme. **4.35**, Vocal and Instrumental Concert: Ruth Meister (Violin). Felix Möller (Baritone), Fritz Römisch ('Cello), and Alf Nestmann (Pianoforte). March and Minuet from the Suite, Carnival (Kienzl); Two Songs (Goltermann): (a) Mailied, (b) Aufgeblüht; Pieces (Reger): (a) Albumblatt, (b) Melody, (c) Humoresque; Adagio, Op. 57, for Violin and Pianoforte (Hillmann); Pianoforte Solo: Extract from Preludes, Op. 21 (Scalero). **5.15**, Talk: Remains of Celtic and Germanic Temples in Trier. **5.40**, Market Prices and To-day's News. **6.0**, Transmission for all German Stations, relayed from **Frankfurt.** **7.0**, Gramophone Records. **7.30**, Variety Programme. **9.0**, News and Sports Notes. **10.0**, Dance Music by the Emde Orchestra. **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—**6.0 p.m.**, Topical Talk. **6.30**, Literary Talk. **7.0**, Relay from the Opera House. In the interval, Weather and News.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW. Luxembourg Evening. **7.0 p.m.**, Talk on Art. **7.35**, Gramophone Music: Overture, The Gipsy Baron (Joh. Strauss); Quadrille (Metra); Polish Festival from Le roi malgré lui (Chabrier). **8.0**, Recital of Songs. **8.30**, News in French. **8.45**, See **Radio-Paris.** In the interval at **9.30** (approx.), News in German. **10.30**, Dance Music on Gramophone Records.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—**7.40 p.m.**, Radio Gazette for Lyons and the South East. **8.30**, Choral and Instrumental Concert relayed from the Salle Molière. Soloists: Alexis Ticier ('Cello), Mme. Lysiane Doriani (Songs) and Jean Bouvard (Organ). After the Concert, News Bulletin.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**10.30 p.m.**, Concert of Popular Music. In the interval at **10.45**, Radio Chronicle. **11.45**, Light Music. **12 Midnight** till Close Down, Concert arranged by the International Broadcasting Company (Ireland), Ltd. Signature Tune: Come Back to Erin. Selection from The Land of Smiles (Lehár); Selection from Viktoria and her Hussar (Abraham); My Beautiful One (Rondot); There's a House on a Hill (Meyer); Hawaiian Waltz Medley (Traditional); Waltz and March from The Vagabond King (Friml); Signature Tune: Come Back to Erin. **12.30 a.m. (Thursday)**, I.B.C. Good-night Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.**, Chimes, Exchange, Topical Talk, Dance Music and Talk by Ramón Gómez de la Serna. **8.15**, Topical Review. **8.30 to 9.30**, Interval. **9.30**, Chimes, Time and Radio Journal. **9.45** (approx.), Concert by the Madrid Philharmonic Orchestra, conducted by Pérez Caas. **11.45**, Radio Journal. **12 Midnight**, Chimes, and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**3.0 p.m.**, Concert by the Station Orchestra, conducted by Plichta. Soloist: Albert Bursik (Flute): Selection from Samson and Delilah (Saint-Saëns); Flute Concertino (Chaminade); Extracts from the Suite, Impressions d'Italie (Charpentier): Overture, Le roi l'a dit (Delibes). **3.50**, See **Prague.** **4.35**, Recitations. **4.50**, Gramophone Music. **5.0**, Market Reports. **5.5**, Talk. **5.15**, See **Prague.** **5.25**, 'Cello Recital by Blazek. **6.0**, See **Prague.** **6.10**, Talk for Soldiers. **6.25**, See **Prague.** **6.40**, Schrammel Quartet Concert. **7.0**, See **Prague.** **9.15** (approx.). Close Down.

MOSCOW

KOMINTERN (RW1), 202.5 kc/s, 1,481 metres; 500 kW.—**3.15 p.m.**, Musical Programme. **3.30**, Educational Talk. **4.30**, Red Army Programme. **5.30**, Programme for Workers on Collective Farms. **6.30**, Talk on Culture and Technics. **7.0**, Extracts from Figaro—Opera (Mozart). **8.0**, Radio Film in German. **8.55**, Chimes from the Red Square. **9.5**, Lecture in English by D. S. Mirsky: Soviet Literature, III. **10.5**, Review of the Month in Czech.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres**; and **Nürnberg, 1,256 kc/s, 239 metres. 3.30 p.m.**, Concert by the Small Station Orchestra, conducted by Karl List: Overture, The Secret Marriage (Cimarosa); Suite, Erotiken (Jensen); Minuet from Falstaff (Verdi); Selection from La Rondine (Puccini); Waltz, Blonde or Brunette (Waldteufel); Miniatures (Cui); Scherzo (R. Strauss); Intermezzo from Si (Mascagni). **4.45** (from **Nürnberg**), Talk: German Troops in India in the Eighteenth Century. **5.5**, Organ Recital by Edouard Kissel: Two Preludes (Heller); Consolation No. 5 (Liszt); Intermezzo (Rheinberger); Improvisations. **5.25**, Talk on Trades: The Upholsterer. **5.45**, Time, Weather and Agricultural Report. **6.0**, Transmission for all German Stations, relayed from **Frankfurt.** **7.0**, Bavarians in America—A Radio Sequence (Josef Wanninger). **7.45**, In der Nacht, in der Nacht. . . . —A Suite by the Station Dance Band, with Commentary. **9.0**, Time and News. **10.0**, Serenade by the Small Station Orchestra, conducted by Karl List. **11.0** (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres**; and **Rjukan, 671 kc/s, 447.1 metres**; and **Jelöy, LCL, 6,990 kc/s, 42.92 metres.**—**4.0 p.m.**, Gramophone Concert. **5.0**, French Lesson. **5.30**, Programme for Girls. **6.0**, Announcements, Weather and News. **6.30**, Talk: The Origin of the Old Testament. **7.0**, Time Signal. **7.1**, Chamber Music by the Danish Quartet. Erling Blech (Violin), Knud Pedersen (Violin), Hans Kassow (Viola), Lützhoft ('Cello). String Quartet in F (Nielsen); Quartet in G (Haydn). **8.0**, Recitations. **8.30**, Agricultural Report. Weather and News. **9.0**, Topical Talk. **9.15**, Concert by the Station Orchestra, conducted by Kramm: Suite for String Orchestra, Aus Holbergs Zeit (Grieg); Two Pieces (Sinding): (a) Soir, (b) Waltz; Norwegian Rhapsody No. 1 (Halvorsen). **10.0**, Dance Music on Gramophone Records. **11.0** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.**, Dopolavoro Announcements, Tourist Talk, Agricultural Notes, and Giornale Radio. **7.20**, Gramophone Music. **7.30**, Time and Announcements. **7.45**, Orchestral Concert; Soloists: Costanza Notarbartolo (Soprano) and Saporetti (Violin): Allegro (Haydn); Soprano Solos; Andante (Mendelssohn); Violin Solos: (a) Air on the G String (Bach), (b) Allegro from the Sonata in C (Leclair); Soprano Solos; Turkish March (Mussorgsky); Violin Sonata in A (Porpora); Passo delle vecchie dame, from the Concerto Veneziano (Casella). In the interval, Talk. After the Concert, Gramophone Music. **10.0**, Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.**, Le Journal Parlé. **7.15**, Weather. **7.25**, Political Review. **7.45**, Programme for Children. **8.15**, Orchestral Concert, conducted by Flament: Spanish Caprice (Rimsky-Korsakov); Italian Caprice (Tchaikovsky); Norwegian Rhapsody (Lalo); Slav Festival (Glazunov). **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.**, Classical Music on Gramophone Records. **7.15**, Journal parlé. **7.30**, Light Music on Gramophone Records. **7.55**, Talk on Economics. **8.0**, Concert. **8.45**, Interval. **9.5**, Scenes from the Revue, Ici Paris, relayed from the Théâtre de Nouveautés. **10.30**, Orchestral Concert, relayed from the Restaurant des Champs-Elysées. **11.0**, News.

PARIS

RADIO-PARIS; Call CFR 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.**, Physical Culture. **7.30**, Weather and Physical Culture (contd.). **7.45**, Gramophone Music. **8.0**, Press Review and Weather. **12 Noon**, Educational Talk. **12.15**, Gramophone Music. **12.30**, Organ Recital by Desserre, relayed from the Gaumont Palace: Extracts from Peer Gynt (Grieg); Melodies from The Gold Diggers (Warren). **1.0 p.m.**, Exchange and News. **1.5**, Gramophone Concert of Opera Music: Overture, The Caliph of Bagdad (Boieldieu); Selection from: (a) Les dragons de Villars (Maillart-Tavan), (b) Les noces de Jeannette (Massé); Overture, La princess jaune (Saint-Saëns); Overture, Gwendoline (Chabrier); Overture, Zampa (Hérold-Winter); Overture, Fra Diavolo (Auber); Selection from Si j'étais roi (Adam). **2.0** and **3.45**, Exchange. **6.20**, Agricultural Talk. **6.45**, Book Review. **7.0**, Medical Talk. **7.20**, Dance Music, Old and New: Le quadrille des Lanciers (Metra); Fascination (Marchetti); Loin du bal (Gillet); Golliwog's Cake Walk (Debussy); La Tzarine (Ganne); Foxtrot, Miami (Learsi); Tango, Tu n'es plus rien (Markush); Java des as (Marceau). **8.0**, Reading. **8.30**, News and Weather. **8.40**, Fashion Review. **8.45**, Concert by the Lamoureux Concert Society,

NOV. 29th WEDNESDAY *continued*

conducted by Albert Wolff: Suite in D (Bach); Prélude à l'après midi d'un faune (Debussy); Pianoforte Concerto No. 2 in G Minor (Saint-Saëns); Sheherazade (Rimsky-Korsakov). In an interval at **9.15**, Press and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.**, Musical Originalities, from **New York.** **7.30**, KDKA Home Forum. **8.0**, Southern Symphonies, from **New York.** **8.15**, Happy Days in Dixie, from **New York.** **8.45**, Human Values. **9.0**, Betty and Bob, from **New York.** **9.15**, Utility Hall. **9.30**, Frances Ingram. **9.45**, News and Market Reports. **10.0**, Uncle Tom and Betty. **10.15**, KDKA Kiddies' Klub. **10.30**, Singing Lady, from **New York.** **10.45**, Orphan Annie, from **New York.** **11.0**, News, Pay Hadey. **11.15**, Sports and Programme Review. **11.30**, Evensong. **11.45 to 3.30 a.m. (Thursday), New York** Relay. **11.45**, Lowell Thomas. **12 Midnight**, Amos 'n' Andy. **12.15**, Gems of Melody. **12.30**, Potash and Perlmutter. **12.45**, Irene Rich for Welch. **1.0**, Crime Clues. **1.30**, Dangerous Paradise. **1.45**, Red Davis. **2.0**, Warden Lawes. **2.30**, John McCormack and Orchestra. **3.0**, Pedro Via's Orchestra.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.**, See **Moravská-Ostrava.** **3.50**, Programme for Children. **4.35**, Gramophone Records. **4.45**, Talk. **4.55**, Gramophone Records. **5.5**, Agricultural Talk. **5.15**, Talk for Workers. **5.25**, News in German. **5.30**, German Transmission: Talk for Workers and Labour Market Report. **6.0**, Time Signal, News and Weather. **6.10**, Advanced French Lesson. **6.25**, Talk on Economics. **6.40**, See **Bratislava.** **7.0**, Talk on the following Transmission. **7.5**, Suk Concert, relayed from the Smetana Hall. Conductor: Vaclav Talich: Meditation on the Choral St. Wenceslaus, Op. 35a, for String Orchestra; The Legend of Dead Victors; Symphonic Poem, Harvesttide. In an interval, Recitation. **9.0**, Time, News, Review of the Day, and Sports Notes. **9.15**, News in French. **9.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28**, Time Signal from Neuchâtel Observatory. **11.30**, News and Weather. **11.40** (from **Geneva**), Gramophone Concert. **12 Noon** (from **Geneva**), Financial Notes. **12.10 p.m.** (from **Geneva**), Gramophone Concert (contd.). **1.0**, Interval. **2.58**, Time Signal from Neuchâtel Observatory. **3.0**, See **Schweizerischer Landessender.** **5.0** (from **Lausanne**), Programme for Children. **6.0** (from **Geneva**), Monthly Science Review. **6.30** (from **Geneva**), Radio Chronicle. **6.59**, Weather Report. **7.0** (from **Geneva**), A Musical Medley by Mlle. Laure Choisy. **7.10** (from **Geneva**), Travel Stories. **7.30** (from **Geneva**), Bach Concert by the Radio-Suisse romande Orchestra, conducted by Francis Bodet, relayed from the Temple de Saint-Gervais. Soloists: Gabrielle Bodet (Soprano), Nelly Gretillat (Contralto), Ernest Bauer (Tenor), Joseph Lombard (Bass), Reichel (Organ) and Charles Koller (Harpsichord). **9.0** (approx.), News and Weather. **9.10** (from **Geneva**), Talk: The Work of the League of Nations. **9.30** (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**8.0 p.m.**, Musical Programme. **8.10**, Weather. **8.20**, Musical Programme and Announcements. **8.35**, Programme to be announced. **9.0**, Chimes. **9.2**, Violin Solos by Thorarinn Gudmundsson. **9.30**, Reading. **10.0**, News. **10.30**, Extracts from Der Rosenkavalier (Richard Strauss) on Gramophone Records.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**6.0 p.m.**, Weather Report. **6.5**, Concert of French Music, conducted by Medins. Soloist: Adolfs Kaktins (Songs). Petite Suite (Debussy); Songs: (a) Soir (Gounod), (b) Hosanna (Granier), (c) Elégie (Massenet), (d) Danse macabre (Saint-Saëns); Suite from Padmavati (Roussel). **7.5**, News. **7.25**, Night in Music—Orchestral Concert, conducted by Medins: Serenade (Goldmark); Clair de lune (Ketelbey); Night in a Moorish Café (Humperdinck); Cortège nocturne (Rabaud); Serenade (Nicodé); Nocturne (Grieg); Bonne nuit, bien-aimée (Sibelius). In the interval at **8.0**, Weather and News. **8.35**, Dance Music. **9.30** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.30 p.m.**; and **2RO, 11,810 kc/s, 25.4 metres.**—**12 Noon to 1.15 p.m.**, Orchestral Concert. In the intervals at **12.30**, Giornale Radio and Exchange, and at **1.0**, Time and Announcements. **3.30**, Children's Radio Review. **3.55**, Giornale Radio, Exchange, and Report of the Royal Geographical Society. **4.10**, Weather Forecast. **4.15 to 5.0**, Orchestral Concert: A Honeymoon Trip (May); Rondo-Caprice (Beethoven); Melody (Abel); Berceuse (Culotta); Selection from Le belle di notte (Cuscina); Waltzing in a Dream (Crosby); O Cele o Celestina (Marescа). **5.40 (Naples)**, Shipping and Sports Notes. **5.45**, Dopolavoro Announcements and Tourist Report. **5.57**, Report of the International Institute of Agriculture (in Italian and English). **6.10**, Agricultural Notes and Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Giornale Radio. **7.0**, Time, Announcements, and Gramophone Music. **7.15**, See **Turin.** **7.30**, Tristan and Isolde—Opera in Three Acts (Wagner). In the intervals, Talk and Announcements. After the Programme, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.**—**7.30 to 8.30 p.m.** (approx.), Milady's Matinée, from **New York.** **12.45 a.m. (Thursday)**, Trials of the Goldbergs, from **New York.** **1.0**, Popular Programme. **1.30**, Variety Programme. **2.0 to 3.30, New York** Relay. **2.0**, Ipana Troubadours. **2.30**, Phillip Morris Programme. **3.0**, Variety Programme. **3.30**, National Radio Forum, from **New York,** followed by Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 a.m.** (from **Zürich**), Ski-ing Lesson. **6.5**, Interval. **11.0** (from **Berne**), Gramophone Concert. **11.29**, Time Signal from Neuchâtel Observatory. **11.40** (from **Berne**), Gramophone Concert. **12.25 p.m.**, Time, Weather and Exchange. **2.30** (from **Berne**), Talk for Women: Indoor Plants. **3.0** (from **Berne**), Concert by the Station Orchestra. **3.30**, Programme of German Swiss Dialect Songs. **4.0**, Famous Waltzes (on Gramophone Records). **4.30**, Concert of Chamber Music. **5.0** (from **Berne**), Programme for Children. **5.30** (from **Zurich**), Talk. **6.0** (from **Zürich**), Time, Weather and Exchange. **6.20** (from **Zürich**), Elementary English Lesson. **6.50** (from **Zürich**), The Secret Marriage—Opera (Cimarosa) In the interval at **8.0** (approx.), Weather and News. **9.15** (approx.), Close Down.

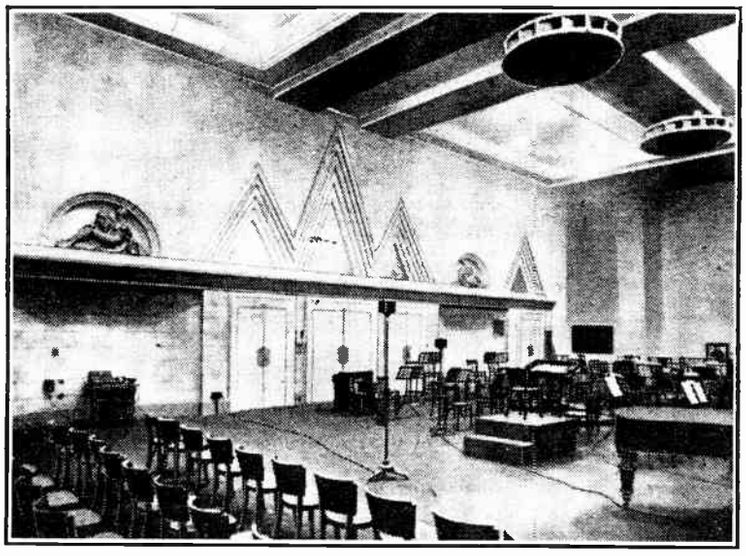
SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**12 Noon to 12.30 p.m.**, Broadcast for Schools. **4.5**, Talk on Hunting, relayed from **Uppsala, 662 kc/s, 453.1 metres.** **4.25**, Gramophone Music. **5.15**, Reading relayed from the University, Uppsala. **6.0**, Kreisler—Thibaud—Hubermann—Gramophone Music. **6.15**, Weather and News. **6.30**, Weather Report. **6.45**, Pianoforte Recital by Mieczyslaw Münz: Melody (Gluck-Sgambati); Minuet (Haydn); Pieces (Chopin): (a) Nocturne in B, (b) Two Preludes, (c) Waltz in F; Prelude (Rachmaninov); The Flight of the Bumble Bee (Rimsky-Korsakov); Impromptu Waltz (Liszt). **7.15**, The Circle—Play (Somerset Maugham). **8.30**, Recital of Swedish Folk Songs. **8.45**, Weather and News. **9.0**, Dance Music, relayed from Berne Hall. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.**, Gramophone Music. **12.45 p.m.**, News. **1.0**, Time. **1.1**, Exchange. **1.5**, Gramophone Concert. **4.45**, Talk in German: Electricity. **5.0**, Orchestral Concert, conducted by Roskam: One-Step, La chanson du canard (Raiter); Waltz, Weinermädln (Ziehrer); Overture, La fille de Madame Angot (Lecocq); Extracts from White Horse Inn (Stolz-Benatzky); Saxophone and Pianoforte: Serenade badine (Gabriel-Marie); Selection from La belle Hélène (Offenbach); Two Melodies (Reisfeld and Marhot); Intermezzo, Patsy (Mydleton); Boston, I can't Remember (Berlin); March, Marching along together (Steininger). **6.0**, Trio Music, relayed from **Lille, 1,128.5 kc/s, 265.8 metres.** **7.0**, Assurance Societies' Reports. **7.15**, Talk: The Skilled Trades. **7.30**, Time and News. **7.45**, Programme for Children, relayed from **Paris (Eiffel Tower).** **8.15**, Press Review in German, and Lottery Results. **8.30**, Concert by the Municipal Orchestra, conducted by Ansermet: Egmont Overture (Beethoven); Symphony No. 4 (Beethoven); Six Epigraphes antiques (Debussy-Ansermet); Symphonic Poem, La Mer (Debussy). In the interval at **9.30** (approx.), News. **10.30**, Orchestral Concert, relayed from the Grand Kleber Taverne. Motor March (Rosay); Waltz (Meisel); Overture, Raymond (Thomas); Serenade, Marie-Louise (Meisel); Potpourri, Au temps des Fiacres (Salabert); Selection from The Gipsy Princess (Kálmán); Potpourri of Airs from Sound Film: (Salabert). **11.30** (approx.), Close Down.



"RADIO ROMA." To-night at 7.30 o'clock Wagner's "Tristan and Isolde" is to be broadcast from this main studio in Broadcasting House, Rome.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.25 p.m.**, Local News and Weather. **12.35**, Concert of Operetta Music by the Station Orchestra, conducted by Otto Seyfert: Overture, Frühlingsluft (Jos. Strauss); Selection from Eine Nacht in Venedig (Joh. Strauss); Waltzes from Der Walzerkrieg (Grothe-Melichar); Overture, Der Opernball (Heuberger); Selection from Paganini (Lehar). **1.30**, See **Frankfurt.** **2.30**, Gramophone Records. **3.0 to 5.35**, See **Langenberg.** **5.35**, Talk: Educational Films in the New Germany. **5.50**, Time, Agricultural Report and Weather. **6.0**, Transmission for all German Stations, relayed from **Frankfurt.** **7.0**, See **Frankfurt.** **7.10**, A Radio Potpourri by the Station Orchestra and Soloists. **9.0**, See **Frankfurt.** **9.20**, What everyone should know. . . . **9.30**, Local News, Weather and Sports Report. **9.45 to 11.0**, See **Frankfurt.** **11.0**, Serenade. **12 Midnight**, Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.**, News. **6.15**, Music by an Argentine Band. **6.30**, Light Music and Classical Music. **6.50**, Talk, followed by Musical Items. **7.15**, News. **7.30**, Overture, Fingal's Cave (Mendelssohn), by the Station Orchestra. **7.45**, Chansonnettes. **8.0**, Accordion Solos. **8.15**, Music from Sound Films. **8.30**, Opera Arias: Arias from Le chalet (Adam), The Bartered Bride (Smetana), Werther (Massenet), and Rigoletto (Verdi). **8.45**, Orchestral Music: Adagietto from Symphony No. 5 (Mahler); Quand l'amour meurt (Crémieux); March funèbre d'une marionette (Gounod). **9.0**, At the Music-Hall—a Radio Fantasy. **9.30**, Opera Music: Scene from Faust (Gounod); Forest Murmurs from Siegfried (Wagner); Selection from Rigoletto (Verdi). **9.45**, Songs. **10.0**, Operetta Music: Selection from Rose Marie (Friml); Air from Countess Maritza (Kálmán); Air from Yes (Yvain). **10.15**, News. **10.30**, Concert for Listeners in Morocco: Air de la folie, from Hamlet (Thomas); Dors O cité perverse, from Hérodiade (Massenet); Recitative and Lia's Aria from L'enfant prodigue (Debussy). Part II: Light Orchestral Music. **11.0**, Request Music. **11.15**, Dance Music. **12 Midnight**, News and Weather. **12.5 a.m. (Thursday)**, Light Music. **12.15**, Music by a Viennese Orchestra: Waltz, España (Waldteufel); Strauss Waltz Potpourri; Three O'clock in the Morning (Marchetti). **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.**, Song Recital. **5.0 to 5.5**, Weather. **5.40**, Giornale Radio, Dopolavoro Report and Gramophone Music. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Gramophone Music. **7.0**, Giornale Radio and Weather. **7.15**, Medical Talk. **7.30**, Gramophone Music. **7.45**, A Play in Three Acts, followed by Dance Music. **10.0**, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and **5,969 kc/s, 50.26 metres (Evening);** 10 kW. —**10.0 to 10.15 a.m.**, Religious Information in Spanish. **7.0 to 7.15 p.m.**, Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**10.30 a.m.**, Concert by the Vienna Chamber Orchestra, conducted by Oscar Jascha. In an interval at **10.55**, Weather. **12 Noon,** Time and News. **12.10 p.m.**, Gramophone Concert. **1.0**, Interval. **2.0**, Time and Announcements. **2.20**, Report of the International Football Match, Austria v. Scotland, relayed from **Glasgow.** **4.20**, Contemporary Austrian Composers (Max Springer). **5.10**, Talk on Hygiene. **5.35**, Talk: Acetylene, its Uses and Dangers. **6.0**, Concert by the Wiener Symphoniker, conducted by Josef Holzer. In an interval at **6.35**, Time and Announcements. **7.15**, The Letter—Play in Three Acts (Somerset Maugham). **9.0**, News. **9.10**, Talk: What the Austrian Government has done for Business. **9.25**, Dance Music, relayed from the Café Palmhof, followed by Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.**, Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5**, Pianoforte Solos by Paderewski (on Gramophone Records). **11.30**, Radio Journal. **11.35**, Literary Programme from **Cracow, 959 kc/s, 312.8 metres.** **12.5 p.m.**, Weather. **12.8**, Interval. **2.25**, Announcements. **2.30**, Economic Notes. **2.40**, Gramophone Music. **3.5**, Programme from **Wilno, 530 kc/s, 566 metres.** **3.40**, Wireless Notes. **3.55**, Light Music by the Cyganeria Theatre Orchestra; Soloist, Lawinski (Songs). **4.50**, Agricultural Notes. **5.0**, Talk. **5.20**, Pianoforte Recital of Dances by Mme. Jonas: Gigue (Lully); Minuet (Muffat); Sarabande (Handel); Bourrée (Bach); Waltz No. 10 (Beethoven); Soirées viennoises (Schubert); Polonaise (Moniuszko); Waltz, Künstlerleben (Joh. Strauss); Foxtrot (Gershwin); Tango (Albeniz). **6.0**, Programme Announcements. **6.5**, Miscellaneous Items. **6.25**, Poetry Reading, relayed from **Wilno.** **6.40**, Sports Notes. **6.47**, Radio Journal. **7.0**, Concert of Polish Music by the Station Symphony Orchestra, conducted by Oximinski; Soloist, Mme Zmigrod-Fedyczkowska (Songs): Entr'acte and Finale from the Symphony in E Minor (Karlowicz); Berceuse for Strings (Naszynski); Symphonic Poem, Stanczyk (Rozycki); Four Songs; Selection from Stara Basn (Zelenski); Mazurka (Mlynarski); Symphonic Variations on a Chopin Prelude in A (Noskowski); Three Songs: (a) Langueur (Lefeld), (b) Sur l'eau (Paderevski), (c) Petite Annie (St. Lipski); Gipsy Dances from Manru (Paderewski); Popular Lithuanian Melody (Cielewicz); Melody (Nowoiejski). In the interval at **8.0**, Talk. **9.15**, Dance Music (on Gramophone Records). In the interval at **10.0**, Weather and Police Notes.

ZURICH.—See **Schweizerischer Landessender.**

THURSDAY
NOVEMBER THE THIRTIETH

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.0 p.m.,** Financial Notes. **7.10,** Shipping Notes. **7.15,** Agricultural Notes and Weather Report. **7.20,** Concert. **7.55,** News. **8.0,** Time Signal. **8.2,** Lottery Results. **8.10,** Talk. **8.25,** News. **8.30,** Le quatrième—Comedy in One Act (Martial Péchaud). **9.10,** Concert of Request Gramophone Music. In the interval at **9.30,** News. **9.55,** News. **10.0,** Concert of Oriental Music.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,357 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report, and Gramophone Concert. **6.0,** Programme for Children. **6.40,** News. **7.0,** French Lesson. **7.15,** Talk. **7.30,** Time Signal. **7.31,** Dr. Annie Patterson in a Programme of her own Compositions. **8.0,** Bass Solos by G. F. Walshe. **8.10,** Piccolo Solos by Mollie Flynn. **8.25,** The Station Orchestra. **8.40,** Soprano Solos by Mme. A. Hefferman. **8.55,** 'Cello Solos by Willie Reidy. **9.10,** The Station Orchestra. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert: Weymouth Chimes (Howgill); Xylophone Solo, Carnival of Venice (Briccialdi); Tales from the Vienna Woods (Joh. Strauss); Sicilietta (von Blon). **9.45,** Concert: Musical Comedy Switch; The Song of Songs (Moya); One Morning very early (Sanderson); Selection from The Belle of New York (Kerker). **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Dance Music: Can't we meet again? Under a Blanket of Blue; Trouble in Paradise; Butterflies in the Rain; Carry me back to Green Pastures; I've found the Right Girl; Smoke Rings; Niagara Moon. **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** Traditional Trio Music. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**6.0 p.m.,** Trio Concert. In the interval: Talk. **7.0,** Request Gramophone Music. In the interval at **7.30,** Exchange. **8.0,** Gramophone Music. **8.30,** Educational Programme: Geography and History Lesson, followed by News. **9.0,** Chimes from the Cathedral, Weather, Exchange and Market Prices. **9.5,** Part Relay of an Opera, from the Gran Teatro del Liceo.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Women. **3.50 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**6.0 p.m.,** Popular Music on Gramophone Records. **6.30,** Talk. **7.0,** Concert of Music by Contemporary Belgrade Composers. **8.0,** Recitations. **8.20,** Concert by the Station Orchestra. **9.0,** Time and News. **9.15** (approx.), Dance Music from the Auto Club.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**11.0 a.m.,** Weather. **11.5,** Gramophone Concert of Sound Film Music. After the Concert, Weather. **11.55,** Time. **12 Noon,** Interval. **12.45 p.m.,** News. **1.0,** Dance Music on Gramophone Records. **1.45,** Programme for Children. **2.15,** Talk: In a Cement Works. **2.30,** Weather and Exchange. **2.45,** Talk: The History of Flying—The Flying Carpet of The Arabian Nights. **3.0,** Concert from **Heilsberg. 4.0,** Advent Festival of the Union of Women Workers (on Gramophone Records). **4.20,** Gramophone Records. **5.0,** Poems. **5.5,** Orchestral Concert. **5.30,** Agricultural Talk. **5.50,** Weather and Announcements. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** To-day's Motto. **7.5,** Choral Concert in Aid of the Winter-Relief Fund, relayed from the Berlin Philharmonic. The Berlin Teachers' Choral Society, conducted by Hugo Rüdel. In the interval at **7.30** (approx.), Theatre Talk. **8.30,** Hans von Bülow, a German Musician—a Dialogue between his Widow and Rudolf Schulz-Dornburg. **9.0,** News and Sports Notes. **9.30,** Report on German Boxing. **9.45,** Weather. **10.0,** See **Leipzig. 11.0** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW.—Relayed by **Zeesen, DJC. DJA, DJD, DJB,** and **DJE.—12 Noon,** Gramophone Concert. Symphony, No. 2, in C, Op. 61 (Schumann); Waltz, Espana (Waldteufel); Tango, Du bist der Traum vom Glück (Borgmann-Buder); Polka, Marionetten (Landschulz); Waltz, Dort tanzt Lulu (Meisel); Tango, Von hunderttausend Frauen bist du die Eine (Lesso-Valerio); Ländler, Für Jung und Alt; Foxtrot, Hiawatha's Lullaby (Young-Donaldson); Waltz, Potpourri from Der Walzerkrieg (Melichar-Grothe); Foxtrot (Woods); Foxtrot (Raffaeli); Paretzer Luisen-Polka (Nicl); Waltz, Schwarzwaldmägdelein (Hildebrandt); Tango, Ein kleines bisschen Liebe (Carste); Waltz (German); Foxtrot, Oh Louise (Brnatzky); Waltz, Dorfschwalben aus Oesterreich (Joh. Strauss); Foxtrot, Atlantis (Robrecht). In the interval at **12.40 p.m.** (approx.), News. **2.0,** Exchange and Agricultural Prices. **2.20,** A Radio Sequence for Girls. **2.50,** The Nutcracker Suite (Tchaikovsky), on Gramophone Records. **3.15,** Stage-Fright before an Operation—Report by a Surgeon. **3.30,** See **Munich. 4.45,** Song Recital by Benjamino Gigli (on Gramophone Records). Arias from Manon (Massenet); The Pearl Fishers (Bizet), Tosca (Puccini), Manon Lescaut (Puccini), and Cavalleria rusticana (Maseagni); Povero Pulcinella (Buzzi-Peccia); Funiculi-Funicula (Denza). **5.10,** Reading (Rudolf Binding). **5.30,** The Funkstunde informs its Listeners. . . . **5.35,** Radio Report from Magdeburg. **5.45,** Topical Talk. **6.0,** Transmission for all German Stations. Beethoven Concert. The Station Orchestra, conducted by Otto Frickhoeffer. Soloist: Rudolf Schmidt (Pianoforte); Pianoforte Concerto in B flat, Op. 19; Symphony in C, Op. 21. **7.5 to 11.0,** Dance Music by Otto Kermbach's Band, the Station Quartet and Choir, conducted by Heinzkarl Weigel. In the interval at **9.0** (approx.), News and Sports Notes. **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**6.15 p.m.,** Radio Journal. **7.35,** News and Racing Results. **7.40,** Talk arranged by the International Labour Bureau. **7.55,** Lottery Results. **8.0,** Talk on Wine. **8.15,** News. **8.30,** Alibi—Comedy in Three Acts (Gabriel Trarieux).

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Dyk. Festival Overture (Bartovsky); Fantasia (Smatek); Extracts from Hélène de Sparte (Brusselmans); Selection from Her Captain (Blecha); March (Moyzes). **3.50,** See **Brno. 4.15,** See **Prague. 4.25,** Talk on Gymnastics. **4.35,** See **Prague. 4.50,** Gramophone Records. **5.10,** Talk on Peasant Life. **5.25,** Concert of Light Music by the Station Orchestra, conducted by Karel Nagl. **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.30,** See **Brno. 7.30,** See **Prague. 10.0** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW.—Relayed by **Gleiwitz, , 1,185 kc/s, 253.1 metres.—11 a.m.,** Weather. **11.5,** Concert by the Silesian Philharmonic Orchestra, conducted by Hermann Behr. Overture, L'Epreuve villageoise (Grétry); Two Movements from the Divertimento in D (Mozart); Three Military Marches (Schubert); Gavotte (Gossec); Die Hofballtänze (Lanner); Overture, The Daughter of the Regiment (Donizetti); Suite, Aus Holbergs Zeit (Grieg); Cavatine (Raff); Waltz, Wo die Zitronenblüh'n (Joh. Strauss). **12.45 p.m.,** Time, News, and Exchange. **1.10,** Programme arranged by the Post Office with Gramophone Records. **1.40,** Agricultural Prices. **2.0,** Schubert Concert on Gramophone Records. Tenor Solo: Die Forelle; The Trout quintet. **3.0,** Programme for Children. **3.20,** Orchestral Concert, relayed from the Café Vaterland. **4.35,** Agricultural Prices. **4.40,** Reading. **5.0,** Talk on Hiking. **5.25,** Programme to be announced. **5.45,** Programme Announcements. **6.0,** Transmission for all German Stations, relayed from **Berlin (Funkstunde). 7.0,** News. **7.10,** Community Singing, relayed from the Südpark Restaurant. **8.10,** St. Andrew's Evening in Silesia—a Radio Report from Waldenburg. **9.0,** See **Munich. 9.20,** Time and News. **9.45,** Serenade on Gramophone Records. **11.0** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.50 p.m.,** Programme for Children. **4.15,** Talk for Young People. **4.25,** See **Prague. 4.50,** Gramophone Music. **5.0,** Theatre and Film Review. **5.15,** See **Prague. 5.25,** German Transmission: News and a Sketch. **6.0,** See **Prague. 6.30,** Variety Programme. **7.30,** See **Prague. 10.0** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Concert of Light Music. **1.0** p.m., Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans. Overture, Tancred (Rossini); Waltz, Fedora (Kálmán); Ton doux sourire (Ray); Selection from Faust (Gounod); 'Cello Solo: Gavotte (Popper); The Song of the Bees (Fillipucci); Sérénade romantique (Guillemyn); Selection from Bouche à bouche (Yvain). **5.0,** Gramophone Concert of Music from Sound Films. **5.30,** Programme for Children. **6.0,** Talk: Women's Work. **6.15,** Stenka Razin (Glazunov), on Gramophone Records. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans. Hindu March (Dupuis); Intermezzo (Pennati Malvezzi); Chant andaloux (Fort); Danse (Saeys); Selection from La jolie Suzette (Weyts); Ballet Music from Terpsichore (Ganne); 'Cello Solo: Remembrance (Desprez); Intermezzo, Korcha (Culotta); Russian Dance (Cabella). **7.15,** Talk for Workers. **7.30,** Sports Notes. **8.0,** Concert by the Station Symphony Orchestra, conducted by Kumps. Overture, Die Fledermaus (Joh. Strauss); Suite orientale (Popy); Invitation to the Waltz (Weber); Selection from The Thieving Magpie (Rossini); Ballet Music from La cigale (Massenet). **8.45,** Talk on the Economic Crisis. **9.0,** Request Gramophone Concert. Rondo alla Turca (Mozart); Pathetic Sonata (Beethoven); Polonaise in E (Liszt); Cavatina (Raff); Duet from Act II and Quartet from Rigoletto (Verdi); Rhapsody, with a Song in my Heart (Rodgers-Coates); Selection from Evergreen (Hart and Rodgers). **10.0,** Le Journal Parlé.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Il Seraglio (Mozart); Campanella (Handel); Minuet from the Septet (Beethoven); Potpourri of Mendelssohn Music (Foulds); Gramophone Music: (a) Gloria (Gevaert), (b) Hallelujah from The Messiah (Handel); Selection from The Barber of Seville (Rossini); Waltz, Künstlerleben (Joh. Strauss). **1.0 p.m.,** Le Journal Parlé. **1.10,** Selection from Iolanthe—Opera (Sullivan) on Gramophone Records. **5.0,** Concert by the Symphony Orchestra, conducted by Kumps: K.V.R. Op Strijdlied (Meulemans); March (Grieg); Les Préludes (Liszt); Mephisto-Walzer (Liszt). **5.30 to 7.15,** Relay from the Sacred Heart Convent at Heverlé. **5.30,** Programme for Children. **6.15,** A Tale for Children. **6.30,** Concert by the Elder Pupils. **7.12,** K.V.R.O. Announcements. **7.15,** Book and Film Review. **7.30,** Talk for Women. **8.0,** Third Act of Lourdes Play (Putman) with Introductory Talk by the Author. **8.45,** Talk arranged by the Ligue du Sacré Coeur. **9.0,** Concert by the Symphony Orchestra, conducted by Kumps: De Vlaamsche Leeuw (Miry); Danse des sorcières (de Boeck); Spanish Fantasia (Gevaert); Three Choral Songs (Vocht) on Gramophone Records: (a) Van Jezus en St. Janneke, (b) Slaap, kindeke, slaap, (c) Des winters als het regent; Overture, Maximilian Robespierre (Litolff); Waltz from The Sleeping Beauty (Tchaikovsky); Slav March (Tchaikovsky). **9.50,** Evening Prayer. **10.0,** Le Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—**4.0 p.m.,** Concert of Variety Music by the Grigoras Dinico Orchestra. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Talk. **6.40,** An Opera on Gramophone Records. In the intervals, Reading and Radio Journal.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on **8.40 metres** from **7.15 p.m.** till **Close Down.—4.30 p.m.,** Concert by the Lajos Kiss Cigány Band. **5.30,** Talk, with Gramophone Records. **6.30,** Recital of French, Spanish and Italian Songs by Therese Köszeghy. **7.15,** Talk. **7.45,** Violin Recital of Spanish Music by Juan Manen, followed by Sonata for Violin and Pianoforte (Cesar Franck), played by Juan Manen and Ernst Dohnanyi. **8.45,** News. **9.10,** Concert by the Budapest Concert Orchestra, conducted by Friedl: Selection from The Merry Wives of Windsor (Nicolai); Hungarian Suite (Weiner); Selection from Adrienne Lecouvreur (Cilea); Ballet Suite, La Source (Delibes); Invitation to the Dance (Weber).

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres;** and **Skamleback, OXY.—11.0 a.m.,** Time and Chimes from the Town Hall. **11.5 to 1.0 p.m.,** String Ensemble Concert, relayed from the Ritz Restaurant. **1.45,** Danish Dance Music by Sid Merrimann's Band. In the interval at **2.30** (approx.), Reading. **3.45,** Programme for Boys. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: Greek Education. **5.15,** Elementary English Lesson. **5.45,** Weather and Announcements. **6.0,** News. **6.15,** Time Signal. **6.16,** Talk: Democracy and Dictatorship. **6.45,** Danish Lesson. **7.10,** Concert of Danish Music, relayed from the State Broadcasting Building. The Radio Symphony Orchestra, conducted by Launy Gröndahl, the Radio Choir, and Soloists: Margherita Flor, Einar Norby, and Preben Rovsing (Songs), and Herman Sandby ('Cello); Tornerose (Heise) for Soloists, Choir, and Orchestra; Ten Minutes' Interval; Movement from the Suite, Elverhoj (Glass); Two Movements from the 'Cello Concerto in D Minor (Sandby); Overture, Klods Hans (Riisager). **9.15,** News. **9.30,** From Heidelberg to Denmark—Variety Programme.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**10.30 to 11.30 a.m.,** Programme in English by the I.B.C. **10.30,** Happy Hour; Part I, Orchestral Concert: Signature Tune; Waltz, Destiny (Baynes); Selection from Countess Maritza (Kálmán); Violin Solo: Souvenir (Drdla); Selection from No, No, Nanette (Younnans); Fairy Tale (Heykens); Guitar Solo: Picking my Way (Lang-Kress); The Busy Bee (Bendix); The Way to the Heart (Lincke); Part II, Dance Music: I've got to get up and go to work; The Three Trees; Lazybones; Who's afraid of the Big Bad Wolf? Forever; Let the World go drifting by; Happy as the day is long; Blue Cloud; Signature Tune. **11.30,** French Programme. **3.30 to 6.0,** Programme in English by the I.B.C. **3.30,** Orchestral Concert: Potpourri, Dubinuschka; The Clock is playing (Blaauw); Xylophone Solo: Fairy Tiptoe (Fredericks); Midnight Waltz (Spoliansky); Ginger Snaps (Bourdon); Xylophone Solo: Fiddlesticks (Robbins); Moonlight at Sanssouci (Rotter); Amoureuse (Berger). **4.0,** Dance Music; Signature Tune, The Bells of Normandy; Ah, but it's Love; The Three Trees; Avalon; I've found the Right Girl; Lover; The Wedding of Mr. Mickey Mouse; Adios, Goodbye; A One Horse Town; Signature Tune. **4.30,** I.B.C. Nursery Corner; Birthday Greetings and Trumpets. **4.40,** Worthing and Littlehampton Concert of Gramophone Records: Signature Tune, The Night by the Sea; In a Clock Store (Orth); I stopped, I looked, I listened; The grass is getting greener all the Time (Burke); Pianoforte Solo: Please handle with care (Stride); Veterans of Variety; Richard of Tauntoa Deane (arr. Molloy); Whispering Flowers (von Blon); Violin Solo: The Pibroch (Goulesco); Wine, Woman and Song (Strauss); Selection from The Quaker Girl (Monckton). **5.20,** Brighton and Hove Concert of Light Music: Trumpets; The Mill in the Forest (Eilenberg); Kisses in the Dark (de Micheli); Piccolo Solo: Fluttering Birds (Gennin); Selection from Wonder Bar (Katscher); Pianoforte Solo: My Heart stood still (Rodgers); The Golden Musical Box (Krome); Romance (Löhr); Signature Tune. **5.45,** Dance Music: The Last Round Up; Pettin' in the Park; You're an Old Smoothie; Shadow Waltz. **6.0,** French Programme. **10.0** till Close Down, Programme in English by the I.B.C. **10.0** (approx.), Sea Shanties; A Life on the Ocean (Binding); At Santa Barbara (Russell); Shenandoah (Terry); Selection from The Pirates of Penzance (Sullivan); The Drunken Sailor (Terry); One Dollar Fifty a Day; Praeludium (Järnefeld); Blow the Man Down; The Merchant Ship. **10.30,** Dance Music, Signature Tune, The Bells of Normandy; Whistling under the Moon; Throw open wide your Window; Who's afraid of the Big Bad Wolf?; Night and Day; I'm getting sentimental over you; My Lucky Day; I can't remember; My Own. **11.0,** Talkie Time; Signature Tune, Sittin' in the Dark; Selection from Love me To-night; Let me give my Happiness to you (Posford); Song, Pretty One (Strauss); Talking to you about me (Snyder); Johnny, from Song of Songs (Hollander); A nous la Liberté (Auric); The Shadow Waltz (Dubin); You are my Heart's Delight (Lehár); Signature Tune. **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Signature Tune, Come back to Erin; Pas des Fleurs (Delibes); Violin Solo: Boublitohka; Norwegian Dance No. 2 (Grieg); The Londonderry Air (arr. Grainger); Minuet (Mozart); Valse des Fleurs (Tchaikovsky); Harlequin's Serenade, from I Pagliacci (Leoncavallo); Selection from A Thousand and One Nights (Strauss); Signature Tune, Come back to Erin. **12.5 a.m. (Friday),** I.B.C. Late News Bulletin. **12.10** (approx.), Club Concert for Valley of the Usk Listeners: Signature Tune, The Chum Song; The Last Round Up (Hill); What a Perfect Combination (Kalmar); Hold your Man (Freed); A Couple of Pals (Gilbert); Symphony of the Breeze (Leon); Melody (Piccioni); Dear Stranger (Hansen); Well done, Gordon (Gilbert); Come out Vienna (Herbert); My Mother's Garden (Hanley); Learn to Croon (Coslow); Tick, Tock (Vienna); I've got you on my mind (Porter); Signature Tune. **1.0,** Organ Recital: Ding, Dong, Ding (Hargreaves); Serenade (Drigo); My Moonlight Madonna (Fibich); Spirit of America (Zamecnik); There's something about a Soldier (Gay); In a Chinese Temple Garden (Ketelbey); Isn't it Heavenly? (Hamburg); The Love Waltz (Heymann). **1.30,** Light Music: Beautiful (Shay); Letting in the Sunshine (Gay); All over Italy (Munroe); That's my Home

NOV. 30th THURSDAY *continued*

(Rene); Pianoforte Selection from The Desert Song (Romberg); Any time, any day, anywhere (Washington); Polly (Zamecnik); Rosa mia (Guizar). 2.0, I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.**—**12.15 p.m.,** Time and News. 12.25, Local News and Weather. **12.35,** See **Stuttgart.** 1.40, Programme for Children. 2.30, Weather Forecast. 2.40, Time and Market Prices. 3.0, Concert by the Station Orchestra, conducted by Hans Rosbaud. Soloist: Julius Dahlke (Pianoforte). Part I: Opera Music by Spohr. Overture and Cavatine from Faust; Extracts from Jessonda. Part II: Music for Pianoforte. Suite (Lully); March and Ländler (Mozart); Variations on a Theme of Gluck (Hummel); Melody (Heller); Abendfantasie (Loewe). Part III: Operetta Music by Ziehrer; Overture, Ein tolles Mädel; Extracts from Der Schätzmeister; Töne Liedchen, töne durch die Nacht from Der Fremdenführer; Polka, Elektrisch; Extracts from Die Landstreicher; Duet from Das dumme Herz; March, Komödianten. 5.0, **to 5.35,** See **Stuttgart.** 5.35, Reading. 5.50, Weather, News and Time. 6.0, Transmission for all German Stations, relayed from **Berlin (Funkstunde).** 7.0, Topical Programme. **7.10 to 9.0,** See **Stuttgart.** 9.0, Time and News. 9.20, See **Stuttgart.** 9.30, Local News and Weather. **9.45 to 12 Midnight,** See **Stuttgart.** 12 **Midnight,** Interval. **12.55 a.m. (Friday)** (also on **Zeesen 31.38 metres**), Concert of German Opera Music by the Station Orchestra. Soloist: Adolf Permann (Baritone). 1.45 (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres,** and **Kiel, 1,292 kc/s, 232.2 metres.**—**6.0 p.m.,** Transmission for all German Stations, relayed from **Berlin (Funkstunde).** 7.0, Mozart Concert; The Hamburg Philharmonic Orchestra, conducted by José Eibenschütz; Soloist, Otto Stadelmaier (Songs); Overture, Cosi fan tutte; Aria from The Magic Flute; Ballet Suite, Die Liebesprobe; Aria from Il Seraglio; Symphony in D, No. 38. 8.10, News. 8.20, Dance Music by the Small Station Orchestra, conducted by Gerhard Maasz. In the interval at 9.0, Time and News. 9.30, See **Berlin (Deutschlandsender).** 9.45, Dance Music (contd.). 11.0 (approx.), Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**12.5 p.m.,** Gramophone Concert: Ballet Suite (Gluck); Am Meer (Schubert); Wanderlied (Schumann); Eine kleine Nachtmusik (Mozart); Air (Bach); Ave Maria (Schubert); Ständchen (Schubert); On Wings of Song (Mendelssohn); Hungarian Dance (Brahms); Romances, Nos. 1 and 2 (Schumann); Overture, The Magic Flute (Mozart). In the intervals at 12.20 and 1.0, News. 1.30, Interval. 2.0, Agricultural Prices and Exchange. 2.30, Talk by Dr. Goebbels: The Hitler-Jugend, Germany's Future Leaders. 3.0, Concert by the Station Orchestra, conducted by Eugen Wilcken: Turkish Suite (Gauwin); American Forest Idylls (MacDowell); Science Idyll (Scassola); Suite, Reminiscences of Cairo (Armandola); Overture, Der Bajazzo (Czibulka); Bei den Wiener Schrammeln (Recktenwald); Scènes poétiques (Godard); Waltz, Estudiantina (Waldteufel). In the interval at 4.0 (approx.), Book Review. 4.55, Elementary English Lesson. 5.15, Agricultural Prices. 5.25, Agricultural Talk. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from **Berlin (Funkstunde).** 7.0, News and Weather. 7.10, Bunter Abend. 8.35 (from **Danzig**), Reading from Granite (Adalbert Stifter). 9.0, News and Sports Report. 9.30, Talk, on Gramophone Records: What People are Saying in America.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.** and 20 kW. from **5.40 p.m.**—**11.41 a.m.,** Concert of Light Music with Gramophone Interlude. 1.55, Interval. 2.10, Quartet No. 17 in C (Mozart). 2.40, Dressmaking Lesson. 3.25, Gramophone Music. 3.40, Programme for Hospitals. 4.10, Concert by the Wireless Orchestra, conducted by Nico Treep. Overture, Rosamunde (Schubert); Mendelssohn Potpourri (Urbach); Marche des petits pierrots (Bosc); Waltz, Myosotis (Waldteufel); Narzissenmädel (Siede); Mephistos Spiel (Dreyer); Serenata amorosa (Becce); Berceuse de Jocelyn (Godard); Selection from Noel Coward's Cavalcade; The Wedding of the Rose (Jessel); Une soir de fête à la Havane (Filipucci); Motor March (Rosey); March, Im Zigeunerlager (Oscheit); Waltz, Man schwebt dahin (Lincke); Hymn to Saint Cecilia (Gounod); The Cat and the Mouse (Engleman); In the Mystic Land of Egypt (Ketelbey). In the interval at 4.40, Radio Play for Children, and at 6.10, Sports Notes. 7.10, English Lesson. 7.40, Time and News. 7.45, Gramophone Music. 7.55, Concert by the Concertgebouw Orchestra, conducted by Ediard von Beinem, relayed from the Concertgebouw, **Amsterdam.** Soloist: Vera Janacopulos (Soprano), Overture (Boecherini); Three Arias (Rameau-Lully); Two Faust Choruses (den Hertog), conducted by the Composer. Soprano and Orchestra: Pribaoutki (Stravinsky); Pastorale d'été (Honegger); Psalm (Markevitch). 10.10, Gramophone Music. 10.40, News. 10.50, Gramophone Music. 11.40 (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.**—**10.40 a.m. till 1.40 p.m.,** Programme of the Catholic Radio Society K.R.O.). 10.40, Gramophone Music. 11.10, Religious Address. 11.40, Police Notes. 11.55, Concert by the K.R.O. Orchestra, conducted by van 't Woud. Wiener Künstler (Schrammel); Overture, Prince Carnival (Blasius); Jung Heidelberg (Millöcker); Blumengeflüster (Blon); Sphinx (Popy); Overture, Czar and Carpenter (Lortzing); Gramophone Music; Toesin (Frietag); Spanish Legend (Rust); A Wedding Journey through Scandinavia (Frederiksen); Serenade (Widor); Selection from Le petit duc (Lecocq). **1.40 p.m.** till Close Down, Programme of the Christian Radio Society (N.C.R.V.). 1.40, Handwork Lesson. 2.40, Programme for Women. 3.40, Bible Reading, followed by Baritone and Organ Recital by J. Smit Duyzentkunst and Smit Duyzentkunst. 4.40, Handwork Programme for Young People. 6.10, Contralto Song Recital by Martaja Fallak. 5.10, Talk. 6.25, Gramophone Music. 6.40, Police Notes. 6.55, Ecclesiastical Notes. 7.10, Review of the Week. 7.40, William of Orange Programme in Memory of his Landing at Scheveningen. The N.C.R.V. Choir and Orchestra. 8.40, Concert by the Small N.C.R.V. Orchestra and the N.V.R.V. Philharmonie Orchestra, conducted by Hurk. In the interval at 8.55, Talk, and at 9.45, News. 10.40, Gramophone Concert. 11.40 (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

NICE, 1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Exchange and News. 8.10, Fashion Review. 8.20, Concert. 9.0, News and Weather. 9.15, Literary and Musical Programme.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.25 p.m.,** News and Weather. **12.35,** See **Stuttgart.** 2.0, Thirty-two Variations in C Minor for Pianoforte (Beethoven), played by Hans Haass. 2.10, Winter Relief—Radio Picture by Wilhelm Rinke. 2.30, Market Prices. 2.50, Political Announcements. 3.0, See **Frankfurt.** 5.0, See **Stuttgart.** 5.35, Talk. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from **Berlin (Funkstunde).** 7.0, See **Frankfurt.** 7.10 to 9.0, See **Stuttgart** 9.0, See **Frankfurt.** 9.20, See **Stuttgart.** 9.30, News. 9.45 to 12 **Midnight,** See **Sttutgart.** 12 **Midnight,** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**11.0 a.m.,** Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber: Overture, The Daughter of the Regiment (Donizetti); Serenade No. 1 in C for Strings (Volkmann); Herselia-Suite (d'Ambrosio); Rhapsody in B Minor (Hartung); Hilmar-Walzer (Dehnert); Selection from The Merry Wives of Windsor (Nicolai). 12.15 p.m., News. 12.30, Gramophone Music. 1.15, News. 1.30, Programme arranged by the Post Office, with Gramophone Records. 2.0 to 2.15, Notes for Taxpayers. 2.35, Market Prices. 3.0, Concert by the Station Orchestra, conducted by Willy Steffen; Soloist, Emil Luh (Violin): Concert Overture (Grieg); Norwegian Rhapsody No. 3 (Svendsen); In Sunny Spain (Elliot); Ein Albumblatt (Wagner); Overture, La Part du Diable (Auber); Five Minuets (Schubert); Turkish March (Mozart). 4.30, Talk: The Beginning of the World. 5.0, Choral Concert. 5.25, Talk: Leipzig, the City of Books. 5.40, Market Prices and Today's News. 6.0, Transmission for all German Stations, relayed from **Berlin (Funkstunde).** 7.0, The Sports Reporter—Humorous Anecdotes. 7.40, Symphony No. 7 in E Flat (Bruckner), in the Municipal and Gewandhaus Orchestras, conducted by Karl Muck, relayed from the Gewandhaus. 8.50, Lyrics (Theodor Storm). 9.0, News and Sports Notes. 10.0, Concert of Folk Music by Bandonion and Mandoline Orchestras: March, Heil Europa (von Blon); Concert Overture No. 3 in C (Kollmaneck); Im grünen Wald, dort wo die Drossel singt (Oscheit); Mandoletta, Op. 57 (Köhler); Stelldichein (Böhme); Paraphrase on the Song, An der Weser (Pressel-Kollmaneck); Polka-Mazurka, Alpenzauber (Gottlöber); Deutsche Weisen (Köhler); Spielmanns Abschied (Höser); Volkslieder-Ranken, Op. 69 (Wormsbacher); March, Zum Städtele hinaus (Meissner); Karl Boss-Marsch (Schuppe).

LINZ.—See **Vienna.**

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—German Evening. 7.0, Symphony in F—the "Pastoral" (Beethoven). 7.50, Topical Talk. 8.0, Song Recital by Angèla Pallas: Three Songs (Schumann): (a) Der Nussbaum, (b) Du bist wie eine Blume, (c) Frühlingsnacht; Three Songs (Brahms): (a) Auf dem Kirchhofe, (b) Der Gang zum Liebchen, (c) Am Sonntagmorgen; Three Songs (Wolf): (a) Das verlassenes Mägdlein, (b) In dem Schatten meiner Locken, (c) Auftrag. 8.30, Concert by the Station Orchestra, conducted by Henri Pensis: Overture, Euryanthe (Weber); Two German Dances (Unger); Melody (Spies); Selection from Die toten Augen (d'Albert); Nuit solitaire (Clemus). 9.45, News in German. 9.55, Selection from The Maid from the Black Forest (Jessel); Potpourri, Vienna by Night (Komzak); Oscar Straus Potpourri (arr. Dostal). 10.20, Dance Music by the Station Jazz Orchestra.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—**7.40 p.m.,** Radio Gazette for Lyons and the South East. 8.30, Concert; Mlle. Carrier (Songs); Mlle. Desgeorges (Harp); Raoul Barthalay (Violin) and Dujols (Viola); Sonata in D Minor (Caporale); Melody (Scarlatti); Harp Solo: Passacaglia (Handel); Préludes romantiques (Tournier); Gretchen am Spinnerade (Schubert); Préludes à deux (Migat); Trio for Strings in C Minor (Beethoven); Une sainte en son auréole (Fauré); Variations for Harp (Samuel-Rousseau); Chinese Song (Vellones); Melody (Coppola); Melody (Castelnuovo Tedesco-Heifetz); Tambourin (Leclair). After the Concert, News.

MADRID

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 10 kW.—**10.30 p.m.,** Programme relayed from **Madrid, EAJ7.**—**12.0 Midnight till Close Down,** I.B.C. Concert of Light Music: The Regiment of Peace (Reisfeld); The Siege of Monte Carlo (Heymann); After Love (Erwin); Smile darn yer, Smile (Rich); Secrets (Discepolo); The Rosary (Nevin); Aloha oe! (Liliuokalani); Hawaiian Sweetheart of mine (Heagney). 12.30 a.m. (Friday), I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Announcements and Programme for Children. 8.15, Radio Journal. **8.30 to 9.15,** Interval. 9.15, English Lesson. 9.30, Chimes, Time and Radio Journal. 9.45 (approx.), El Tesoro Imaginario—Radio Play (Pérez Ferrero and Julio de la Serna) with Incidental Music by Felipe Briones. 11.45, Radio Journal. **12.0 Midnight,** Chimes. **1.0 a.m. (Friday) till Close Down,** I.B.C. Concert of Dance Music: With you here and me here; Louisville Lady; Egypt; Morella Waltz; Blue Prelude; Say it with Music; My Kingdom for a Smile from you; Down in the Valley; Blaze Away; Parade of the Minutes; Step Lightly; I lay me down to Sleep; Then the Moon came out; In Santa Lucia; A Waltz, a Night, a Tune; Spanish Sweetheart; Si petite. 2.0, I.B.C. Goodnight Melody and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.30 p.m.,** German Transmission: Talk. 6.0, See **Prague.** 6.30, Concert by the Station Orchestra, conducted by Musil; Selection from The Geisha (Jones); Canzonetta (Friml); Spanish Intermezzo, Andalusia (de Tacye); Suite (Tapp); Czech Humoresque (Roob); Two Pieces (Boucek). 7.30, See **Prague.** 10.0 (approx.), Close Down.

MOSCOW

KOMINTERN (RW1), 202.5 kc/s, 1,481 metres; 500 kW.—**3.15 p.m.,** Talk. 3.30, Educational Programme. 4.30, Red Army Programme. 5.30, Programme for Workers on Collective Farms. 6.30, Technical Talk. 7.0, Literary Programme. 8.0, Review of the Week in German. 8.55, Chimes from the Red Square. 9.5, Review of the Week in French. 10.5, Literary Programme in Spanish.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**3.30 p.m.,** Concert by the Small Station Orchestra, conducted by Karl List: Overture, The Pearl Fishers (Bizet); Suite, In a Fairy Realm (Ketelbey); Andalusian Romance (Sarasate); Selection from The Flying Dutchman (Wagner); Waltz, Moosrosen (Schubert); Hungarian Rhapsody No. 13 (Liszt); Was die Quelle singt (Schytte); Serenade (de Taeye). 4.45, Agricultural Talk. 5.5, Recital of German Folk Songs. 5.25, Time, Weather and Agricultural Report. 5.40, Talk on Gramophone Records: What People are saying in America. 6.0, Transmission for all German Stations, relayed from **Berlin (Funkstunde).** 7.0, Variety Programme. Part I, The Bavarian Schrammel Quartet and Soloists. Part II, Besserer Herr gesucht (Refined Gentleman Wanted)—A Tragic-Comedy (Borro-Schwerla). 8.0, Concert by the Station Orchestra, conducted by Hans Winter. Soloist: Otto Goebel (Bass): Concerto grosso (Handel-Mottl); Two Songs for Bass and Orchestra (Schiffmann); Italian Serenade (Wolf); Sinfonietta (Jung). 9.0, Austria. 9.20, Time, News and Sports Notes.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres; Rjukan, 671 kc/s, 447.1 metres; and Jeløy, LOL, 6,990 kc/s. 42.92 metres.**—**4.0 p.m.,** Orchestral Concert, relayed from the Theatre Café. 5.0, German Lesson. 5.30, Divine Service. 6.0, Announcements, Weather and News. 6.30, Variety Programme by Pitt and Pott. 7.0, Time Signal. 7.1, Agricultural Talk. 7.30, A Journey around Europe with the Microphone. In the interval at 8.40, Weather and News, and at 9.0, Topical Talk. 11.0 (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Agricultural Notes and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Operetta Music: Extracts from Rossini (Bellini), and The Merry Widow (Lehár). 8.30 (approx.), Lo zio prete—One-Act Comedy (Tonelli). 9.0 (approx.), La Gran Via—Musical Play in One Act (Valverde). 10.0, Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals). **5.45 p.m.,** Le Journal Parlé. 7.15, Weather. 7.25, News. 7.30, Gramophone Concert. Weber Music: Overture and Arias from Der Freischütz; Perpetuum mobile; Invitation to the Waltz. 8.0, Political Review. 8.15, Gramophone Concert (contd.). Selection from Les Dragons de Villars (Maillart); Saltarelle (Vieuxtemps); Pas des fleurs (Delibes); Les pleurs de Manon (Gillet); The Druids' Prayer (Dawson); In the Temple of the Bells (Yoshitomo); La buissonière (Walrence); Le plus légère (Messier); Défilé des bataillons (Blémant); Allegresse (Allier). 9.0 (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music. 7.5, Variety Item. 7.10, Agricultural Talk. 7.15, Le Journal Parlé. 7.30, Programme for Children. 8.0, Talk. 8.5, Topical Talk. 8.20, Interval. 8.40, Concert. 9.10, Interval. 9.30, Concert. 10.30, News.

PARIS

RADIO-PARIS; Call CFR 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. 7.30, Weather and Physical Culture (contd.). 7.45, Gramophone Music. 8.0, Press Review and Weather. 12 **Noon,** Protestant Address. **12.30 p.m.,** Literary and Musical Programme

(on Gramophone Records). Part I, Readings from Le Cid (Cörneille), Polyeucte (Corneille); Andromaque (Racine), Berenice (Racine), L'Avare (Molière), and Tartuffe (Molière). Part II, Folies musicales (Betove); Souvenirs de Bayreuth (Fauré-Messager); Selection from Carmen (Bizet); The Nutcracker Suite (Tchaikovsky); Le petit Rentier (Pierné); La cage de cristal (Ibert); Suite No. 2 (Stravinsky). In the interval at 1.0, Exchange, News, and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.20, Agricultural Talk. 6.45, Legal Talk. 7.0, Talk on Maurice Rollinat. 7.20, Gramophone Music: Trink-Trink (Bendix); Songs of the Hebrides (Kennedy-Fraser); Yvonne (Loyraux); La femme qu'on aime (Leardy-Gabrielle); Phonomanie (Avignon). 7.45, Review of the German Press. 8.0, Two Plays. In the interval at 8.40, Review by Bonnaud, and at 9.15, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**6.45 p.m.**, Football Game (to be announced). 9.45, Thursday Special, from **New York.** 10.0, Federation of Pennsylvania Women. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from **New York.** 10.45, Orphan Annie, from **New York.** 11.0, News, Pat Haley. 11.15, Sports and Programme Preview. 11.30, Evensong. 11.45, Lowell Thomas, from **New York.** 12 **Midnight,** Amos 'n' Andy, from **New York.** 12.15 **a.m. (Friday),** Marvellous Melodies. 12.30, Lois Miller, Organist. 12.45 **to 3.30, New York** Relay. 12.45, Concert Footlights. 1.0, Captain Diamond. 1.30, Adventures in Health. 1.45, The Revellers. 2.0, Death Valley Days. 2.30, Lady Esther Serenade. 3.0, Hands across the Border.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Bratislava.** 3.50, See **Brno.** 4.15, Talk for Workers: The Czecho-Slovak Glass Exhibition. 4.25, Gramophone Records. 4.35, Elementary French Lesson. 4.50, Gramophone Records. 5.5, Agricultural Talk. 5.15, Talk on Economics. 5.25, News in German. 5.30, German Transmission: Book Review and Agricultural Programme. 6.0, Time, News and Weather. 6.10, Talk. 6.15, Talk on Books. 6.30, See **Brno.** 7.30, Saint Helena—a Play in Four Acts (Heinz Steguweit). 9.0, Time, News, Review of the Day and Sports Notes. 9.15, Introductory Talk in Czech, German and French to the following Transmission. 9.25, String Quartet in E Minor, From Out My Life (Smetana), by the Czech Quartet. 10.0 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS; 743 kc/s, 403 metres; 25 kW.; and **Geneva, 400 kc/s, 749.9 metres.**—**6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from **Geneva**), Variety Items. 12 **Noon** (from **Geneva**), Financial Notes. 12.10 **p.m.** (from **Geneva**), Gramophone Concert. 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0 (from **Geneva**), Concert by the Radio-Suisse Romande Orchestra, conducted by Echenard. Soloist: Pépin (Flute). Overture, The Secret Marriage (Cimarosa); Ballet Music from Rosamunde (Schubert); Flute Solo: Minuet from Orpheus and Eurydice (Gluck); Sinfonia (J. C. Bach); March militaire française (Saint-Saëns); Kéler-Béla Potpourri; Serenade (Löhr); Melody (Rosen); Walt, La housarde (Ganne). 5.0 (from **Lausanne**), Baking Lesson. 5.30 (from **Lausanne**), Talk on the Scout Movement. 5.55 (from **Lausanne**), Tourist Report. 6.5 (from **Lausanne**), Talk: Aviation in 1783—the First Fire Balloon and the First Gas Balloon. 6.30 (from **Lausanne**), Agricultural Talk. 6.59, Weather Report. 7.0 (from **Lausanne**), 'Cello Recital by Gabriel Bise: Sonata in E Minor (Ariosti); Canzonetta (Bruck); Minstrel Song (Glazunov); Oriental (Cui); Humoresque (Julien). 7.30 (from **Lausanne**), The Gipsy Princess—Operetta in Three Acts (Kálmán), relayed from the Bel-Air Theatre. In the interval at 8.30 (approx.), News and Weather. 10.0 (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**8.0 p.m.,** Musical Programme. 8.10, Weather. 8.20, Musical Programme and Announcements. 8.35, Programme to be announced. 9.0, Chimes. 9.2, Concert by the Radio Trio. 9.30, Reading. 10.0, News. 10.30, Arias on Gramophone Records, followed by Dance Music. 11.30 (approx.), Close Down.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**6.5,** Paganini—Operetta in Three Acts (Lehár). In the intervals, News and Weather. 8.30, Classical Music on Gramophone Records. Minuet, Allegro and Finale Vivace from the Symphony in D (Haydn); Andante cantabile from the Quartet in G (Mozart); Adagio from the Pathetic Sonata (Beethoven); Air (Bach); Aria from The Messiah (Händel); Allegro moderato and Andante from Trio No. 1 (Schubert).

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres** from **7.45 p.m.**; and **2RO, 11,810 kc/s, 25.4 metres.**—**12.10 to 1.15 p.m.,** Concert from **Turin.** In the intervals at 12.30, Giornale Radio and Exchange, and at 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.50, Giornale Radio and Exchange. 4.0, Talk. 4.10, Weather Forecast. 4.15, Vocal and Instrumental Concert: Enrichetta Petacci (Pianoforte), Annibale Bucchi (Violin), Luigi Chiarappa ('Cello) and Gianna Perea Labia (Soprano); Pianoforte Trio in B, Op. 8 (Brahms); Soprano Solos: (a) Arietta (Blangini, (b) Nina pazza per amore (Paisiello), (c) Song (Proch); Pianoforte Trio in B flat, Op. 99 (Schubert). 5.0, Talk: The College of Agriculture. 5.40 **(Naples),** Shipping and Sports Notes. 5.45, Dopolavoro Announcements and Tourist Report. 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Soprano Solos by Elisa Capolino. 7.30, Giornale Radio and Sports Notes. 7.45, Symphony Concert conducted by Rito Selvaggi. In the intervals, Literary and Art Notes and Announcements. 10.0, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres,** and by **W2XAD** on **19.56 metres.**—**12.45 to 4.0 a.m. (Friday), New York** Relay. 12.45, Trials of the Goldbergs. 1.0, Popular Programme. 2.0, Capt. Henry's Show Boat. 3.0, Popular Programme. 4.0, Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.**—**5.50 a.m. to 6.5** (from **Berne**), Gymnastics. 9.20 (from **Berne**), Broadcast for Schools. 9.50, Interval. 11.0 (from **Zürich**), Hints for Housewives. 11.5 (from **Zürich**), Concert by the Small Station Orchestra, conducted by Scherbaum. 12.25 **p.m.** (from **Zürich**), Time, Weather and Exchange. 2.30 (from **Zürich**), Light Music by the Station Orchestra. 3.0, See **Radio-Suisse Romande.** 5.0 (from **Basle**), Light Music on Gramophone Records. 5.30 (from **Basle**), Legal Talk: The Employment Contract. 6.0 (from **Basle**), Time, Weather and Tourist Report. 6.5 (from **Basle**), Review of New Gramophone Records. 7.0 (from **Basle**), Talk: Inventors and Inventions. 7.30 (from **Basle**), Violin Recital. 8.0, Weather and News. 8.10 (from **Basle**), Concert by the Railway Male Voice Choir and Hans Vogt (Pianoforte). 9.15 (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.**—**4.5 p.m.** (from **Göteborg**), Divine Service. 4.30, Programme for Children. 4.45, Gramophone Music. 5.45, Elementary English Lesson, relayed from **Jönköping, 1,490 kc/s, 201.3 metres.** 6.15, Weather and News. 6.30 (from **Göteborg**), Talk. 7.0, Arthur Hazelius Memorial Programme. Choral and Orchestral Concert, conducted by Sven Kjellström and Soloists: Helga Görlin (Soprano) and Joel Berglund (Bass); Offertorium (Södermann); Cantata (Rangström). In the interval: Address by Andreas Lindblom. 8.20, Radio Report. 8.45, Weather and News. 9.0, Concert by Eva Pawlo (Songs), Lottie Andreasson (Violin), Helge Lindeberg (Pianoforte) and Fritjof Kjellberg (Pianoforte). Selection from A Midnight Tango (Komzak); Violin Solos: (a) Serenade (Townsend), (b) Poème (Fibich), (c) Tango (Albéniz); Pianoforte Duets: (a) Waltz (Greer), (b) Foxtrot, Russian Cocktail (Kaper); Violin Solos: (a) Lullaby (Juon), (b) Gipsy Dance (Nachez); Three Pieces (Lindberg). 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Gramophone Concert. 12.45 **p.m.**, News. 1.0, Time and Exchange. 1.5, Light Music on Gramophone Records. 2.0, Programme for Children. 3.0, Orchestral Concert, conducted by Roskam: Overture, Sous la Régence (Brusselmans); Waltz from Der Rosenkavalier (R. Strauss); Promenade sous bois (Lacombe); Selection from Les Saltimbanques (Ganne); Selection from Hans the Flute Player (Ganne); Sous la Feuillée—Aubade for Flute, Clarinet, and String Orchestra (Sandré); Hymn to the Sun and Indian Dance (Rimsky-Korsakov); Radio March (Pekking). In the interval from 3.30 to 3.45, Elocution Lesson. 4.15, Programme for Children, relayed from **Bordeaux-Lafayette, 986 kc/s, 304 metres.** 6.0, Talk in German ou Austrian Literature: Hugo von Hofmansthal. 6.15, Talk for Housewives. 6.30, Gramophone Records of Light Music. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results, and Announcements. 8.30, Concert of Chamber Music by Mme. Biellmann (Soprano), Bour (Pianoforte), and the Station Soloists: French Suite in G (Bach); Andante for Horn (Gottermann); Songs: (a) Butterfly (Campra), (b) Aria from Julius Cæsar (Handel); Quintet for Flute, Oboe, Clarinet, Bassoon, and Horn (Monfeuillard); Pianoforte Sonata (Mozart); Songs: (a) Aria from Il Re pastore (Mozart), (b) Prayer from the Music to Goethe's Faust (Schumann); Scherzo for Bassoon (Delaunay); Oboe Solo: Circassian Dance (Moreau); Songs: (a) Réponse d'une epouse sage (Roussel), (b) Le Bachelier de Salamanque (Roussel), (c) Le Tombeau (Poulenc), (d) Attributs (Poulenc); Five Pieces on the Name Bach: (a) Piece (Roussel), (b) Ricercare (Cassela), (c) Waltz-Improvisation (Poulenc), (d) Prelude to an imaginary Fugue (Malipiero), (e) Prelude, Arioso, and Fughetto (Honegger). In the interval at 9.30, Press Review in French. 11.30 (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.**—**12.25 p.m.**, Local News and Weather. 12.35 **to 1.30,** Concert by the Cast of the Scala, Milan, on Gramophone Records. 2.0, Programme for Children. 3.0, See **Frankfurt.** 5.0, Spanish Conversation. 5.20, Talk. 5.35, Talk on Photography. 5.50, Time, Agricultural Notes and Weather 6.0, Transmission for all German Stations, relayed from **Berlin (Funkstunde).** 7.0, See **Frankfurt.** 7.10, Goethe—Mörike—Heynike—Recital of Lyrics, with Commentary, relayed from the Liederhalle. The Station String Quartet and Walter Reuschle (Recitations). 8.0, Concert by the Station Orchestra, conducted by Gustav Görlich. 9.0, See **Frankfurt.** 9.20, What everyone should know. . . . 9.30, Local News. Weather and Sports Report. 9.45, Gramophone Music. 10.0, Concert (continued). 11.0, Serenade. 12 **Midnight,** Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. 6.15, Music by a Viennese Orchestra. Du und Du (Strauss); Tales from the Vienna Woods (Strauss); Lieder der Liebesnacht (Lincke); Was Blumer träumen (Translateur). 6.30, Programme for Children. 7.0, Tango Songs. 7.15, News. 7.30, Pianoforte Recital. Fantaisie impromptu (Chopin); Séguidilla (Albéniz); La soirée dans Grenade (Debussy); Gavotte variée (Rameau). 7.45, Military Music. 8.0, Opera Arias. Arias from Mirella (Gounod), Les dragons de Villars (Maillart), Lakmé (Delibes) and Werther (Massenet). 8.15, Operetta Music. Selection from The Chocolate Soldier (O. Straus); Waltz from The Girl in the Taxi (Gilbert); Selection from A Waltz Dream (O. Straus). 8.30, Music from Sound Films. 8.45, Music by the Symphony Orchestra. Ballet Music from Rosamunde (Schubert); Norwegian Dance No. 2 (Grieg); Symphonic andante (Bach); Hungarian Dance No. 2 (Brahms). 9.0, Moretti Concert. Songs from Delphine. Ah, quelle Gare, Si tu veux, Sous les toits de Paris, Un soir de reveillon, Conte Obligado, Le roi des palaces and Il est charmant. 9.30, Orchestral Music. 9.45, Opera Music. Varlaam's Aria from Boris Godunov (Moussorgksky); Aria from The Mastersingers (Wagner); Aria from Sigurd (Reyer). 10.0, Accordion Solos. 10.15, North African News. 10.30, Concert of Songs and Military Music for Listeners in Morocco. 11.0, Light Music by a Viennese Orchestra. 11.15 Dance Music. 12 **Midnight,** News, Weather and Announcements. 12.5 **a.m. (Friday),** Chasonnettes. 12.15, Dance Music: Two Steps. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m., till Close Down,** See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.**—**4.10 p.m.,** Chamber Music on Gramophone Records: Ridda di folletti (Bazzini); Scherzo and Tarantella (Wieniavsky); Sarabande and Allegretto (Corelli-Kreisler); Minuet from the Quartet No. 18 (Mozart); Minuet (Becker); Cantilène (Goltermann); Canzonetta (de Laserna); Liebestraum (Liszt-Schipa); Fanciulla (Ciampi); Humoresque from the Quartet in A Minor (Ippolitov-Ivanov). 5.0 **to 5.5,** Weather. 5.40, Giornale Radio, Dopolavoro Report and Gramophone Music. 6.0, Time, Tourist Report and Gramophone Music. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Giornale Radio, Weather and Gramophone Music. 7.25, Talk on the following transmission. 7.30, La giornata di Marcellina—Opera in Three Acts (Attilio Parelli), conducted by the Composer. Talk and Literary Notes in the interval. Giornale Radio after the Opera.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in French. 7.0 **to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.**—**11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: Overture, The Barber of Seville (Rossini); Selection from Tiefland (d'Albert); Flute Solo: Minuet (Mozart); Waltz, Phantasiebilder (Jos. Strauss); Kinderliedersuite (Blech); Potpourri, Strauss-Federn (Morena); March, St. Luis (Komzak); Waltz (Waldteufel); Fantastic Suite, Kalif Storch (Wenzl); Song, Wiener-Wald-Zauber (Prechtl); Die bösen Buben (Manfred); Ländler, Gebirgsmelodien (Preis); Selection from Don Cesar (Dellinger); Overture, Der Göttergatte (Lehár). In an interval at 12 **Noon,** Time and News. 1.0 **p.m.,** Interval. 2.0, Time and Announcements. 2.15, Talk: The Austrian Shoe Industry. 2.25, Programme for Children. 2.50, Gramophone Concert of Operetta Overtures: Im Reich des Indra (Lincke); Flotte Bursche (Suppé); The Gipsy Baron (Joh. Strauss); Banditenstreiche (Suppé); La belle Hélène (Offenbach). 3.30, Talk on Gardening. 3.50, Talk for Women: The Convents of Austria. 4.15, Soprano and Pianoforte Recital by Anny Kimmelmann and Anny Nikel. Two Songs (Schumann): (a) Erstes Grün, (b) Aus den östlichen Rosen; Three Songs (Brahms): (a) Nicht mehr zu dir zu gehen, (b) Folk Song, Mein Mädel hat einen Rosenmund, (c) Salome; Pianoforte Sonata in G Minor, Op. 88 (Fuchs). 4.55, Talk on Tin. 5.20, Talk: Conditions in Austria To-day. 5.45, Theatre Review. 5.55, Aïda—Opera in Four Acts (Verdi), relayed from the State Opera House. In the interval at 6.45, Time and Announcements, and at 8.0, News. 9.15, Talk in Hungarian. 9.25, Light Music on Gramophone Records, followed by Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Polish Songs on Gramophone Records. 11.30, Radio Journal. 11.35, Concert by the Philharmonic Orchestra, with Commentary. Conductor: Oziminski. Soloist: Karkowska (Songs). Overture, Figaro (Mozart); Air (Bach); Minuet and Finale from Symphony No. 7 (Haydn); Turkish March, from The Ruins of Athens (Beethoven); Classic Songs; Overture (Nowowiejski); Polish Songs; Gipsy Dance (Moszkowsky); Mazurka from Janula (Moniuszko). 1.0 **p.m.,** Weather. 1.3, Interval. 2.25, News. 2.30, Economic Notes. 2.40, Orchestral Concert, relayed from **Lwów, 788 kc/s, 381 metres.** 3.40, Programme for Women. 3.55, Aria and Song Recital by Wyszatyski. 4.10, Pianoforte Recital by Jasinski: Prelude and Triple Fugue in E Flat (Bach—Busoni); Minuet in A Minor (Rameau-Godowsky); Two Extracts from Le tombeau de Couperin (Ravel); Sonata No. 5, Op. 53 (Scriabin). 4.50, Rural Programme for Young People. 5.0, Talk: Books and the Reader. 5.20, Dramatic Programme. 6.0, Programme Announcements. 6.5, Miscellaneous Items. 6.25, Topical Talk. 6.40, Sports Notes. 6.47, Radio Journal. 6.55, Interval. 7.0, Concert by the Symphony Orchestra, conducted by Oziminski. Soloist: Pia Ravenna (Songs). Suite Alsacienne (Massenet); Barcarolle (Dlutowsky); Minuet (Bolzoni); Petite marche viennoise (Kreisler); Three Songs (Sibelius); Four Songs (Järnefelt); Tone Picture for Violin, Harp and Orchestra, Les Nereïdes (Brusselmans); Song from King Christian II (Sibelius); Berceuse (Järnefelt); Valse triste (Sibelius); Songs: (a) Lullaby (Hainikainen), (b) Mademoiselle Rococo (Melartin), (c) Two Songs (Klemetti), (d) Finnish Lullaby (Merikanto); La pendola armoniosa (Pick-Mangiagalli); Rhapsody on Popular Swedish Melodies (Lindberg). In an interval at 8.0, Answers to Correspondents. 9.0, Cigány Music. In an interval at 10.0, News.

ZURICH.—See **Schweizerischer Landessender.**

NOV. 30th THURSDAY *continued*

FRIDAY
DECEMBER THE FIRST

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW. **7.0 p.m.,** Financial Notes. **7.10,** Shipping Notes. **7.15,** Agricultural Notes and Weather Report. **7.20,** Dance Music. **7.55,** News. **8.0,** Time Signal. **8.2,** Lottery Results. **8.10,** Saint-Saëns Concert by the Station Orchestra, conducted by Defosse: Symphonic Poem, La Jeunesse d'Hercule; Adagio from Symphony No. 3; Ballet Music from Javotte; Selection from La Princesse Jaune; Phaëton; Marche héroique. In the interval at **8.35,** News, and at **8.40,** Talk. **9.55,** News.

ATHLONE

726 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres;** and **Cork, 1,337 kc/s, 224.4 metres.**—**1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Programme for Children. **6.45,** News. **7.0,** Gardening Talk. **7.15,** Literary and Dramatic Talk. **7.30,** Time Signal. **7.31,** The Station Orchestra. **7.45,** The Caledonian Male Voice Choir. **8.0,** The Station Orchestra (contd.). **8.15,** Choral Concert (contd.). **8.30,** Mezzo-Soprano Solos by Mary Maguire. **8.45,** Concert by the Station Orchestra. **9.15,** Traditional Songs by Patrick Parle. **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Concert of Dance Music: Little Sunshine; The Grass is getting Greener; Madrid; Are you sure you love me?; Sophisticated Lady; Goodnight Vienna; Looking Forward; Moonlight Madonna. **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: The Merry Widow Waltz (Lehár); Selection from Chu Chin Chow (Norton); Song, An Old Violin (Fisher); Racing Commentary; Ständchen (Heykens); Trumpet Solo: Rockin' Chair (Carmichael); Song: Alice Blue Gown (Tierney); Over the Waves (Rosas). **10.30,** I.B.C. Goodnight Melody, followed by News and Weather. **10.40,** Fiddle and Accordion Recital by Harpur and Bates. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW. **6.0 p.m.,** Trio Concert: Selection from The Rhinegold (Wagner); Melody (Tchaikovsky); Song of the Bees (Filipucci); Minuet, Op. 81 (Drdla); Selection from Mephistopheles (Boito); Intermezzo (Delmas); Polonaise in F (Schubert). **7.0,** Request Gramophone Music. **7.30,** Exchange and Gramophone Music (contd.). **8.0,** Gramophone Music. **8.30,** Educational Programme: Geography and History Lesson, followed by News. **9.0,** Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. **9.10,** Concert by the Radio Orchestra, Soloist: Julio Jarque (Violin) **10.30,** Dance Music relayed from the Casa Llibre. In the interval at **11.0,** News. **12 Midnight** (approx.), Close Down

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

398 kc/s, 429.7 metres; 2.5 kW. **6.0 p.m.,** Talk. **6.30,** A Musical Play. **8.0,** Military Band Concert. In the interval at **9.0,** Time and News. **9.45,** Cigány Music from the Dva Jelena Restaurant.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**1.0 p.m.,** Light Music on Gramophone Records. **2.0,** Programme for Girls. **2.30,** Weather and Exchange. **2.45,** Talk. The History of Flying—The Airship Crianozzo. **3.0,** Concert, relayed from **Stuttgart.** **4.0,** Talk: Can Culture be taught? **4.25,** Folk Song Duets and Trios by the German Women's Trio; Old German Folk Songs for Trio; (a) Ich muss von hinnen scheiden, (b) Goldringelein, (c) Ich armes Mädlein, (d) Wenn ich ein Voglein wär, (e) Es flog ein Täublein weisse, (f) Schlaf mein Kindelein: Duets: (a) Treue Liebe, (b) Die Sonne scheint nicht mehr, (c) Das Veilchen, (d) Zwei Königskinder, (e) Sandmännchen, (f) Abendsegen; Sacred Songs for Three Voices (Mozart); (a) Götter, welch schwere Prüfung, (b) Einsam und still will ich beklagen, (c) Glaubt mir, Beständigkeit ziert die Liebe. **5.0,** Poems. **5.5,** Legal Talk. **5.25,** Wolfgang Hermann reads from the Book, Sturm 33 (Hans Maikowski). **5.45,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Heilsberg.** **7.0,** To-day's Motto. **7.5,** Talk: Preparations for Ski-ing. **7.20,** Topical Talk. **7.30,** Winke, bunter Wimpel—Radio Ballad (Alfred Karrasch), with Incidental Music by Walter Gronostay. **9.0,** Weather and News. **9.45,** Weather. **10.0,** Gramophone Report of a Boxing Contest in the Sportpalast. **10.15,** Concert, relayed from **Frankfurt.** **11.0** (approx.). Close Down.

BERLIN

FUNKSTUNDE; 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.**—**2.20 p.m.,** Gramophone Concert: Andante and Finale from the Flute Concerto in C (Mozart); Andante and Rondo from the Bassoon Concerto (Mozart); Larghetto from the Violin Concerto in D (Mozart); Finale from the Violin and 'Cello Concerto in A Minor (Brahms). **3.0,** See **Heilsberg. 4.0,** See **Hamburg. 5.0,** The Little Pleasures of Everyday Life—Anecdotes. **5.15,** A Leap from an Aeroplane—Reminiscences by the first Woman Parachutist. **5.30,** The Funkstunde informs its Listeners . . . **5.35,** Talk: Sport and the Press, from the Viewpoint of a Sports Enthusiast. **6.0,** Transmission for all German Stations, relayed from **Heilsberg.** **7.5** till Close Down. See **Heilsberg.** **11.0** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BRATISLAVA

1,073 kc s, 279.5 metres; 14 kW.—**4.5 p.m.,** Trio Concert. **5.5,** Sports Report. **5.20,** Recitation. **5.40,** Lesson in Telegraphy. **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.10,** Talk: The National Holiday of Yugoslavia. **6.25,** Flute Duets: Duet, Op. 75 (Mozart); Duet, Op. 2 (Quantz). **6.55,** See **Prague. 9.30** (approx.). Close Down.

BREMEN. See **Hamburg.**

BRESLAU

923 kc s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc s, 253.1 metres.**—**1.10 p.m.,** Gramophone Concert. **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.35,** Programme for Children. **3.0,** Concert by the Station Orchestra, conducted by Rischka. In an interval at **3.45,** Humorous Talk, followed by Agricultural Prices. **4.55,** Talk: Silesian Dialect. **5.20,** Programme to be announced. **5.40,** Programme Announcements and Market Prices. **6.0,** Transmission for all German Stations, relayed from **Heilsberg. 7.0,** News. **7.10,** Young People in Town and Country—Programme for Country People. **8.0,** Concert by the Station Orchestra, conducted by Tipitz: Rakoczy March; Hungarian Comedy Overture (Keler-Bela); Zigeunerromanze, Debreczin (Meisel); Czardas, Ilona (Parkas-Miska); Violin Solo: Czardas (Monti); Pesther-Walzer (Lanner); Hungarian Fantasia, Hungaria (Leopold); Hungarian Dances Nos. 5 and 6 (Brahms); Bei der Zigeunerkapelle (Meyer-Helmund); Violin Solo: Zigeunerweisen (Sarasate); Bokreta-Czardas (Keler-Bela); Polonaise No. 2 (Liszt); Song and Czardas (Lehár); Violin Solo: Hejre Kati (Hubay); Chal Romano (Ketelbey); Czardas from Der Geist des Wojewoden (Crossmann); Zigeunerständchen (Nehl); Rosza-Czardas (Hubay). In an interval at **9.0,** Time and News.

BRNO

878 kc/s, 342 metres; 35 kW.—**3.0 p.m.,** Concert by the Station Orchestra, conducted by Jan Janota: Overture, Der Waffenschmied (Lortzing); Selection from Much Ado about Nothing (Korngold); Selection from The Flying Dutchman (Wagner); Ballet Intermezzo (Bayer); Medley of Russian Music (Leopold). **3.55,** See **Prague. 4.5,** See **Bratislava. 5.5,** Talk: Creative Art. **5.15,** Talk for Workers. **5.25,** German Transmission: Sports Notes, Topical Talk and Literary Review. **6.0,** See **Prague. 6.25,** J. Pleva reads from his own Works. **6.40,** Violin Solos by Karel Hanousek. **6.55 till Close Down,** See **Prague. 9.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Gramophone Concert of Variety Music. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, The Secret Marriage (Cimarosa); Eine Kleine Nachtmusik (Mozart). **1.20,** Soprano Song Recital by Simonne de Val: Quo Vadis? (Nouguès); Tes yeux (Babey); Scherzo-valse, Le bonheur (Thiebaut). **1.35,** Orchestral Concert (contd.). Violin Concerto (Tartini-Chamnont); Träumerei (Schumann); Song without Words (Mendelssohn). **2.0,** Broadcast for Schools. **5.0,** Concert by the Radio Orchestra, conducted by Franz André. **6.0,** Talk: Some Legal Points in Connection with Old Age Pensions. **6.15,** Accordion Recital by Thomas Sprimont: Marche militaire (Schubert); Ballet Music from Faust. **6.40,** Twelve Mazurkas (Chopin) by Oscar Delvigne (Pianoforte). **7.15,** Talk on Telegrams. **7.30,** Legal and Literary Talks. **8.0,** Concert by the Radio Orchestra, conducted by Franz André: Overture, Don Pasquale (Donizetti); Good News (Sylva and Brown); Aragonesa (Falla); La cinquantaine (Gabriel Marie); Mazurka naturaliste (Ganne); Songs, Minuet from Orphée (Gluck); Foxtrot, My Darling (Myers); Foxtrot, Call me your only Boy (Bemets); Selection of Negro Spirituals (Foulds). **8.45,** Travel Talk. **9.0,** Concert by the Station Symphony Orchestra, conducted by Kumps: Soloist, Simone Istace (Songs) and Kalkman (Viola); Norwegian Rhapsody (Lalo); Interlude in Old Style (Glazunov); Humoresque (Frémolle); Songs, (a) Aria from L'enfant prodigue (Debussy), (b) Romanian Song, (c) Aria from Figaro (Mozart); Piece for Viola and Orchestra (Dupuis); Nursery Suite (Ingelbrecht); Persian Dance (Rimsky-Korsakov); Gothic Minuet (Boëllmann); Viennese Waltz (Loncque). **10.0,** Le Journal Parlé. **10.10,** La Brabançonne.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Groeninghe (van Hoof), on Gramophone Records, followed by Music by the Small Station Orchestra, conducted by Pierre Leemans. **12.25 p.m.,** Request Programme: Midnight Tango (Komjati); Selection from The Land of Smiles (Lehár); Schubertiana (arr. Hermann Finck). **12.40,** Music by the Small Station Orchestra: Overture, The Gipsy Baron (Joh. Strauss); Violin Solo, Zigeunerweisen (Sarasate); Selection from Zigeunerprimas (Kálmán). **1.0,** Le Journal Parlé. **1.10,** Gramophone Music. **1.30,** Gramophone Music. **1.45,** Gramophone Music: Czardas (Grossmann); Waltz, Acclamation (Waldteufel); March (Haef). **2.0,** Broadcast for Schools. **5.0,** Concert by the Symphony Orchestra, conducted by Kumps. **5.45,** Programme dedicated to St. Nicholas. **7.30,** Wireless Notes. **8.0,** Gramophone Record: Mijne Moedertaal (Brandts-Buys). **8.5** (approx.), Concert by the Symphony Orchestra, conducted by Kumps. **8.45,** Announcements. **8.50,** A pleasant Interlude. **9.5,** Concert by the Radio Orchestra, conducted by Franz André: Le chant du gondolier (d'Agrèves); Sur l'eau (Desaart); Barcarolle from The Tales of Hoffmann (Offenbach); Waltz (Fetras). **9.25,** Paul Lebrun Songs—Recital by Mme. Aerts and M. de Hen: Vlaanderen; Kleine moederke; Zonnevonken; Lentelust. After the Recital, Recitations: Le Sermon d'Eulenspiegel, and Announcements. **9.45,** Concert by the Radio Orchestra (contd.): Une promenade joyeuse en traîneau (Chwatal); Les patins d'or (Weyts); The Skaters' Waltz (Waldteufel); De Vlaamsche Leeuw (Miry). **10.0,** Le Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—**4.0 p.m.,** Concert by the Station Orchestra: March (Brandner-Eppler); Waltz, Dynamiden (Jos. Strauss); Overture, La belle Hélène (Offenbach); Selection from Iris (Mascagni); Serenata d'Amalfi (Becce); Russkaya and Trepak (Rubinstein); Selection from The Duchess of Chicago (Kalman); Ballet Scene, Piazza del Popolo (Fredericksen); Barcarolle (Tchaikovsky); Piece (Dicker); Babillage (Gillet). In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** Talk on the following Transmission. **7.10,** Polish Festival Concert by the Philharmonic Orchestra, conducted by Fitelberg: Soloist, Szymanowski (Pianoforte); Extract from A Drama at a Masked Ball (Karlowicz-Fitelberg); Symphony No. 4 for Pianoforte and Orchestra (Szymanowski); Extract from the Ballet, Harnasie (Szymanowski); Mazurka from Hacka (Moniuszko). In the interval at **8.0,** Reading. **8.45,** Radio Journal.

BUDAPEST

545 kc s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **6.30 p.m.** till **Close Down.**—**4.30 p.m.,** Gramophone Music. **5.10,** Shorthand Lesson. **5.40,** Pianoforte Recital by Magda Vasarhelyi. **6.30,** Programme relayed from the Royal Hungarian Opera House. News in the interval. After the Relay, Concert of Cigány Music, with Recital of Hungarian Songs, relayed from the Café Emke. **10.0,** Talk in French: Charles Lotz.

CASSEL. See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres,** and **Skamlebaek, OXY, 49.4 metres;** 0.5 kW.—**11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.15,** Broadcast for Schools. **11.45,** Concert by the Leonard Gyldmark String Ensemble, relayed from the Bellevue Strandhotel. **1.0 p.m.,** Interval. **2.0,** Concert by the Mogens Hansen Instrumental Ensemble: Overture, La Cenerentola (Rossini); Algerian Nights (Gregh); Waltz, Le printemps (Waldteufel); Berceuse and Prelude (Järnefelt); Overture, Les Savoyardes (Offenbach); Turkish March (Mozart); Andante cantabile (Tchaikovsky); German Dance (Reger); Intermezzo from L'amico Fritz (Mascagni); Waltz in A (Dvorak); Serenade (Lange-Müller); French Comedy Overture (Kéler-Béla). In an interval at **2.45** (approx.), Reading. **4.0,** Programme for Children. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: Great Figures of Danish Literature—Bödtcher. **5.15,** Elementary German Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk. **7.0,** Time Signal from the Town Hall. **7.1,** Programme by Per Knutzon. **7.10,** Recital of Spanish Songs by Else Brems. **7.30,** Indvielsen (The Initiation)—Radio Play in One Act (Schlichtkrull). **8.40,** Light Music on Gramophone Records. **8.55,** News. **9.10,** Reading of Danish Poems (Edith Rode). **9.30,** Sonata in F, Op. 6 (R. Strauss), for 'Cello and Pianoforte, played by Rudolf Dietzmann and Walter Meyer-Radon. **10.0,** Dance Music by the Aage Juhl-Thomsen Band, relayed from the National Scala. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.30** (approx.), Close Down.

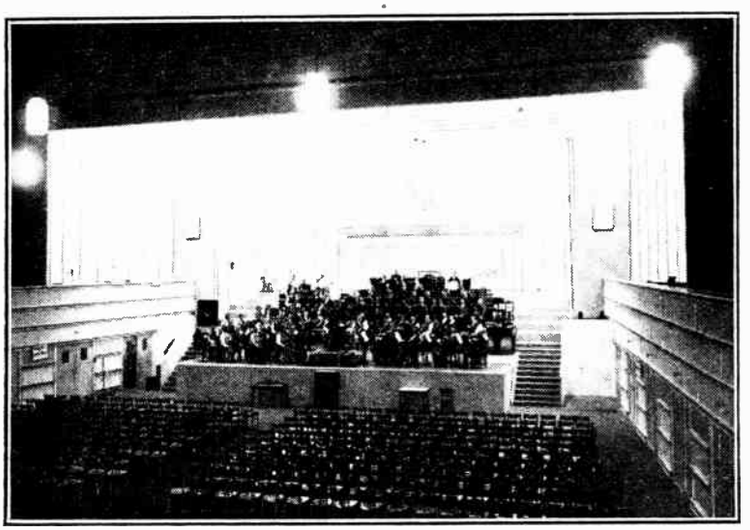
CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. till 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I—Accordion Band. Signature Tune; The best of the bunch (Alexander); Dinah (Lewis); Valse, La Reine (Alexander); Accordion Joe; Song, My Girl ran away (Steinberg); Cuban Mazurka (Alexander); Song, Never too old (Allan); Cocktails (Cuvelier). Part II—Dance Music: The Cage in the window; Ah, but it's love; Sundown in a little Green Hollow; Two Buck Tim from Timbuctoo; Twelfth Street Rag (Buday); Put on your



BUILT FOR BROADCASTING. The impressive new concert hall studio at the Deutschlandsender, Berlin, showing the symphony orchestra at rehearsal.

old grey bonnet (Wenrich); Music hath charms (Harris); Sweet dreams pretty lady (Downey); Signature Tune. **12 Noon,** Programme in French. **3.30 to 6.0,** Programme in English by the I.B.C. **3.30,** Military Music: Overture, Rienzi (Wagner); Wiegenlied (Brahms); Song, The Old Superb (Stanford); War March of the Priests (Mendelssohn); Song, The Two Grenadiers (Schumann); March (Wagner): Marche militaire (Schubert). **4.0,** Dance Music: Signature Tune, Bells of Normandy; A Couple of Pals (Gilbert); My Moonlight Madonna (Fibich); Love's Lane (Miller); Everyone loves my Marguerite (Woods); The Cage in the Window; Sweetheart Darlin'; Lazybones; Solitario; Signature Tune. **4.30,** The I.B.C. Nursery Corner: Birthday Greetings; Trumpets. **4.40,** Concert for Southampton and Winchester Listeners—From the Cotton Fields: Signature Tune, The Night by the Sea; Down South (Myddleton); Levée Song; O dem Golden Slippers (Bland); The Tiger's Tail (Thurban); By the Swanee River (Myddleton); Poor Old Joe (Foster); Lazy Pete (Kernstein); Deep River (Trad.); Banjo Quartet, Darktown Dandies (Morley); When Malindy Sings (Myddleton); The Watermelon Fête (Myddleton); Plantation Sougs Medley. **5.20,** Concert for Bournemouth and Weymouth Listeners: Gipsy Music; Black Eyes (Scherler); Violin Solo, Caprice Viennois (Kreisler); C'est l'amour (Pierre); The Gipsies (Higgs); Violin Solo, Hejre Kati (Hubay); Komm Cigány (Kálmán); Hungarian Dance No. 6 (Brahms); Pity Me (Trad.); Spanish Gipsy Dance (Brahms); Hungarian Dance No. 2 (Brahms); March of the Russian Hussars (Trad.); Signature Tune. **6.0,** Programme in French. **10.0** (approx.) till Close Down, Programme in English by the I.B.C. **10.0** (approx.), Request Programme: Please (Robin); So long lads, we're off; In the Valley of the Moon (Tobias); How deep is the Ocean? (Berlin); The Sanctuary of the Heart (Ketelbey); Bitter Sweet Waltz (Coward); Play Fiddle, Play. Good-bye (Tosti). **10.30,** Dance Music: Signature Tune, The Bells of Normandy; Happy Ending (Parr-Davies); It's not a Secret any more (Blue); Who's afraid of the big bad Wolf? (Churchill); Little Romany (Leon); I've got to get up and go to work (Hupfeld); Si, si (Remy); Oh Johanna (Lawrence); Tick, Tock (Vienna); Signature Tune. **11.0,** Talkie Time—Tunes from the Talkies and Shows: Signature Tune, Sittin' in the Dark; Forty Second Street (Dubin); Vilja Song from The Merry Widow (Lehár); Peter (Hollander); Selection from He wanted Adventure (Waller); But for you (Hollander); Selection from The Duharry (Millöcker-Mackeben); How could we be wrong? (Porter); Live, Love and Laugh (Heymann); Signature Tune. **11.30,** Club Concert for Sennybridge Listeners. Part I—Gramophone Records. Signature Tune, The Chum Song; Savoy Welsh Medley (arr. Somers); In a country lane (Coates); Sam's Medals (O'Hagan); Wayside Rose (Lehár); Clapham and Dwyer's Fairy Tales; Since you went away (Johnson); Jesu Cyfaill F'enaid (Evans-Perry); Sweet and Low. **12.5 a.m. (Saturday),** Late News Bulletin in English. **12.10** (approx.), Club Concert. Part II—Dinner at Eight. My Own; Moths around the candle flame; The Last Round Up; Well done, Gordon (Gilbert); Signature Tune. **12.30,** Dance Music: Isn't this a night for love; My Kingdom for a smile from you; Happy as the day is long; For you, just you, my baby; If I had someone to love; The Wedding of Mr. Mickey Mouse; Shadows on the Swanee; Elvira. **1.0,** Dance Music: Signature Tune, The Bells of Normandy; I've got to pass your house; Aloha Oe; Sing another line; I'll show you off; Dawn in Montmartre; Don't blame me; With you here and me here; Cecilia Mia; It's the talk of the town; Morning, Noon and Night; Forever; Sundown in a little Green Hollow; Adorable; Isn't it heavenly; Nunca; Dear Stranger; Signature Tune. **2.0,** I.B.C. Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35,** Concert by the Station Orchestra, conducted by Reinhold Merten. **1.40,** Talk for Housewives. **2.30,** Weather. **2.40,** Time and Economic Notes. **3.0,** See **Stuttgart. 5.0 to 5.35,** See **Langenberg. 5.35,** Talk: The Claims and Tasks of Socialism. **5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Heilsberg. 7.0,** Topical Talk. **7.10 to 9.0,** See **Langenberg. 9.0,** Time and News. **9.20,** See **Stuttgart. 9.30,** News. **9.45,** Concert of Light Music. **10.0,** Concert by the Station Orchestra, conducted by Hans Rosbaud: Soloist: Friedrich Noack (Bass); Part I—Eighteenth Century Music. Part II—Light Music. **11.0,** Talk by the Manager of the Frankfurt Broadcasting Stations. **11.10,** German Mysticism—Talk on Count Platen. **12 Midnight** (approx.), Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

DEC. 1st FRIDAY *continued*

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres,** and **Kiel, 1,292 kc/s, 232.2 metres.—4.0 p.m.,** Variety Programme. **5.0** (from **Hanover**). Reading (Mardorf). **5.30,** Folk Song Sequence on Gramophone Records. **5.45,** Frankfurt Exchange and Hamburg Market Prices. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Heilsberg. 7.5** till Close Down, See **Heilsberg.** In the interval at **9.0,** Time and News.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.—12.5 p.m.,** Gramophone Concert of Variety Music. In the intervals at **12.20** and **1.0,** News. **1.30,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices and Exchange. **2.15,** Programme for Children. **2.40,** Programme for Women. **3.0,** Concert by the Small Station Orchestra conducted by Eugen Wilcken: Tanz-Szenen-Suite (Richter); Slav Rhapsody (Volpatti); Selection from Das Dorf ohne Glocke (Künneke); Indian Canzonetta (Dvorak); Dance (Dvorak); Overture, William Tell (Rossini); Waltz Intermezzo (Brache); Gruss an Wien (Siede); Selection from The Three Wishes (Ziehrer); Barbara March (Schlenk). In an interval at **4.0** (approx.), Talk: Sport from a Ski-maker's Point of View. **4.45,** Talk on Domestic Animals. **5.15,** Agricultural Prices. **5.25,** Musical Programme for Children. **5.50,** Weather. **6.0,** Transmission for all German Stations—Concert of Contemporary Music by the Königsberg Opera House Orchestra, conducted by Erich Seidler: Soloist: Hugo Kolberg (Violin); Festival Prelude (Unger); Violin Concerto in B minor, Op. 57 (Wetz); Symphonic Improvisation (Frickhoeffer). **7.0,** News. **7.5,** The Story of Königsberg Cathedral. **7.15,** Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner: Selection from Salome (R. Strauss); Grotesque Suite for Wood Wind Instruments (Rücker); First Peer Gynt Suite (Grieg); Der Tanz in der Dorfschenke (Liszt); Pesther-Walzer (Lanner); Overture, The Siege of Corinth (Rossini). **8.30,** Reading (Irmgard Weithase). **9.0,** News. **9.15** (approx.), Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Part I, Italian Music: Overture (Verdi); Ballet Music from La Gioconda (Ponchielli); Selection from The Sunken Bell (Respighi); Dolce Notte (Leoncavallo); Venetian Barcarolle (Leoncavallo); Overture, Anne Boleyn (Donizetti). Part II, Variety Music: Overture, Eine Nacht in Venedig (Joh. Strauss); Melodies in Two-Four Time (Geissler); Johann Strauss Potpourri (Fahrbach); Selection from The Little Dutch Girl (Kalman). **11.0** (approx.), Close Down.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to **5.40 p.m.,** and 20 kW. from **5.40 p.m.—11.40 a.m. to 3.40 p.m.,** Programme of the General Broadcasting Society (A.V.R.O.). **11.40,** Time Signal. **11.41,** Gramophone Music. **12.10 p.m.,** Concert of Light Music by Kovacs Lajos and his Orchestra. **2.10,** Talk: Marriage in the East. **2.40,** Gramophone Music. **3.40 to 7.40,** Programme of the Workers' Radio Society (V.A.R.A.). **3.40,** Gramophone Music. **4.30,** Programme for Children. **5.10,** Concert by the V.A.R.A. Orchestra, conducted by de Groot: Overture (Donizetti); Adoration ((Filipucci); Italian Street Singers (Niemann); Four Pieces for Orchestra (d'Ambrosio). **5.45,** Organ Recital by Jong: Berceuse tendre (Danieriff); Aubade printanière (Lacombe); Selection from The Daughter of the Regiment (Donizetti). **6.5,** Gramophone Music. **6.10,** Orchestral Concert (contd.): Uncle Teddy (Fucik); Boston (Nick); Two Alsatian Peasant Dances (Merkling); Variations on Le Carnaval de Venice (Ritzau). **6.40,** Talk. **6.55,** Accordion and Pianoforte Recital: Flapperette (Greer); The Wedding of the Winds (Hall); Fourth Hungarian Dance (Brahms); Los Banderillos (Volpatti). **7.10,** Orchestral Concert (contd.): Die Musik kommt (Strauss); Waltz Scherzo (Strauss); Walzer-Redoute (Hildebrandt); Selection from the Music to Cavalcade (Coward). **7.40 to 10.40,** Programme of the Liberal Protestant Radio Society (V.P.R.O.). **7.40,** Religious Address. **8.10,** Song and Pianoforte Recital: Aria from Judas Maccabaeus (Händel); Aria from Joshua (Händel); Aria (Graun); Pianoforte Solos: (a) Caprice, (b) Fantasia (Händel); Songs: (a) Das Veilchen, (b) An Chloë (Mozart), (c) Frühlingsglaube (Schubert), (d) Auf dem Wasser zu singen (Schubert). **8.40,** Talk: The Church in Modern Times. **9.10,** Song and Pianoforte Recital (contd.): Songs: (a) Aubade (Bizet), (b) Les Vendanges (Saint-Saëns); Pianoforte Solos: (a) Allegro appassionata (Saint-Saëns), (b) L'Isle joyeuse (Debussy); Songs: (a) Traum durch die Dämmerung (Richard Strauss), (b) Du meines Herzens Krönelein (Richard Strauss), (c) Wer hat dies Liedlein erdacht? (Mahler). **9.40,** News. **9.55,** Talk: Shakespeare's Tragedies—King Lear. **10.25,** Gramophone Music. **10.40** till Close Down, Programme of the V.A.R.A. Gramophone Concert. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.,** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.**—Programme of the Catholic Radio Society (K.R.O.). **11.40 a.m.,** Concert by Fabian and his Orchestra: Selection from William Tell (Rossini); You are the Girl for me (Sorge); Life is good (Micheli); White Jazz (Casaloma); Melody (Grothe); Vision of Love; Potpourri, Von Wien durch die Welt (Hruby); Gramophone Music; The Rosary (Nevin); Lazybones (Mercer); Air (Brodsky); A Fête in Aranjuez (Demerssemann); Melody. **1.40 p.m.,** Gramophone Music. **2.40,** Recitations. **3.0,** Gramophone Music. **3.15,** Recitations (contd.). **3.40,** Interval. **3.55,** Gramophone Music. **4.55,** Concert by the K.R.O. Boys, conducted by Lustenhouwer. In the interval at **5.40,** Talk: The Red Cross. **6.40,** Police Notes. **6.55,** Talk. **7.15,** Gramophone Music. **7.25,** Talk on Astronomy. **7.40,** Music by the K.R.O. Boys. **8.10,** Press Review. **8.15,** Stemmen uit ons aller Jeugt—Radio Play (Rockenbach); Translation by Bekkers. **9.0,** Concert by the K.R.O. Orchestra, conducted by Gerritsen. Soloist: Mlle. Hans Gruys (Mezzo-Soprano). Overture to Goethe's Faust (Schumann); Prayers (Caplet); Selection from Raymonda (Glazunov); Suite algérienne (Saint-Saëns). **9.40,** Gramophone Music. **9.55,** Concert (contd.): Overture, Le Baruffe Chiozzotte (Sinigaglia); Five Spanish Airs. (arr. Schuurman); Three Spanish Dances (Granados); Piece in Three-Four Time (Wagenaar). In the interval at **10.25,** News. **10.40,** Gramophone Music. **11.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

NICE, 1,205 kc/s, 249 metres; 0.8 kW.—**8.0 p.m.,** Amusement Guide, Exchange and News. **8.10,** Esperanto Lesson. **8.25,** Concert. **9.0,** News and Weather. **9.15,** Concert. **10.30,** Special Transmission for Central Europe: Concert. Military March (Jurek); Joys of Spring (Ailbout); Dance of the Grasshoppers (Bucalossi); Der Rosenhochzeitzug (Jessel); The Druids' Prayer (Davson); Dreaming (Joyce); Le dindon dans la paille (Cuion); Irish Melody (arr. Sowerby); Serenade (Heykens); Song, The Broken Heart (Moya); American Suite (Thurban); Uncle Pierrot (Burnley Jones); Jollification (Reever); Old Popular Melodies; Melody (Pollito); Goodbye, Argentina (Rodriguez); Vivienne (Finck); Longing (Haydn-Wood); Song of the Volga Boatmen; Shining Moon; Hungarian Melodies (Leopold); Idylle bohémienne (arr. Ferraris); Fantasia (Kálmán); Romanian Fantasia (Stefanesco); Wine, Woman and Song (Joh. Strauss); Frühlingsstimmen (Strauss).

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.15 p.m.,** See **Frankfurt. 12.25,** News and Weather. **12.35,** See **Frankfurt. 2.0,** Soprano Song Recital by Anni Beuthel, with Pianoforte and Violin Accompaniment. **2.15,** Talk: Excursions in the Rhineland and Westphalia. **2.30,** Economic Notes. **2.50,** Political Announcements. **3.0,** Concert from **Stuttgart. 5.0,** English Conversation Lesson. **5.20,** Talk on Genealogy. **5.35,** Gramophone Music. **5.50,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Heilsberg. 7.0,** See **Frankfurt. 7.10,** A Journey through Westphalia—Radio Pictures (Rudolf Predeek). **8.10,** Dance Music by the Station Band, conducted by Kühn. **9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News. **9.45,** A Flying Visit. **10.0** till Close Down. See **Frankfurt. 12 Midnight** (approx.), Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.—12.30 p.m.,** Arias from Opera on Gramophone Records. **1.15,** News. **1.30,** Art Report. **2.15,** Programme for Women. **2.35,** Market Prices. **3.0,** Concert by the Station Orchestra, conducted by Hilmar Weber: Three Movements from Tafelmusik (Telemann); Ein musikalischer Spass (Mozart); Second Movement from the Military Symphony (Haydn); Allegretto scherzando from the Eighth Symphony (Beethoven); Ballet Music from Rosamunde (Schubert). **4.0,** Books for the Hitler Jugend. **4.25,** Talk: Gothic Architecture in North Germany. **4.50,** Concert by the Roma Trio. **5.40,** Economic Notes and News. **6.0,** Transmission for all German Stations, relayed from **Heilsberg. 7.0,** Der Wildschütz—Opera in Three Acts (Lortzing). **9.0,** News. **10.0,** Concert Relay. **11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW. Dutch Evening.—**7.0 p.m.,** Gramophone Concert: Overture Anacréon (Cherubini); Symphony No. 4 (Tchaikovsky). **7.55,** Concert by the Station Orchestra, conducted by Pensis: Overture, Hamlet (Bach); Le jeune Berger (Marsick); Selection from Andrea Chenier (Giordano); Berceuse (Vreuls); Pesther Walzer (Lanner); Les joyeuses Fileuses (Gillet); Badinage (Jongen). **8.50,** News in French. **9.0,** Dichterliebe (Schumann)—Song Recital by Gustave Simon. **9.35,** Concert by the Station Orchestra, conducted by Pensis: Prologue to I Pagliacci (Leoncavallo); Elegy (Massenet); Waltz, O Frühling wie bist du so schön (Lincke); Grand'maman (Lange); Oriental Suite (Popy). In the interval at **9.50,** News in German. **10.25,** Dance Music on Gramophone Records.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 10 kW.—**10.30 p.m.,** Concert of Popular Music. In the interval at **10.45,** Radio Chronicle. **11.45,** Light Music. **12 Midnight** till Close Down. I.B.C. Concert of Dance Music: P.C. 123 (Munroe); Peter, Peter (Connelly); Two Buck Tim (Goodhart); Sweetheart Darlin' (Kahn); Street of Dreams (Lewis); Yes, Mr. Brown (Abraham); Avalon (Jolson); One Tiny Tear (Connelly). **12.30 a.m. (Saturday).** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes, Exchange, Announcements, Programme for Women, and Dance Music. **8.15,** Radio Journal. **8.30 to 9.30,** Interval. **9.30,** Chimes, Time and Radio Journal. **9.45** (approx.), Aïda—Opera (Verdi), on Gramophone Records. **11.45,** Radio Journal and Programme Announcements for Listeners Abroad. **12 Midnight,** Chimes and Close Down.

MALMO.—See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.15 p.m.,** See **Prague. 6.40,** Chromatic Accordion Music. **6.55 till Close Down,** See **Prague. 9.30** (approx.), Close Down.

MOSCOW

KOMINTERN (RW1), 202.5 kc/s, 1,481 metres; 500 kW.—**3.30 p.m.,** Educational Talk: Capital. **4.30,** Red Army Programme. **5.30,** Programme for Collective Farm Workers. **6.30,** Talk: Fascism. **7.0,** Concert. **8.0,** German Programme. **8.55,** Chimes from the Red Square. **9.5,** Programme in English. **10.5,** Programme in Czech.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres. —3.30 p.m.,** Concert by the Station Orchestra, conducted by Karl List. Soloist: Willy Stuhlfauth: Leonora Overture No. 2 (Beethoven); Violin Concerto (Mojsisovics); Ballet Music from Czar and Carpenter (Lortzing); Waltz (Reger); Selection from Tiefland (d'Albert); Waltz, Bei uns z' Haus (Joh. Strauss); Triumphal March from Aida (Verdi). **4.30,** Reading (Paul de Lugardé). **4.45,** Programme for the Younger Generation. **5.5,** Pianoforte Recital by Fritz Hübsch and Ludwig Schmidmeier: Nocturne, Op. 77 (Renner): Intermezzo in E flat minor, Op. 45, No. 3 (Reger); Waltzes from Waltz Duets (Eiseman). **5.25,** Illustrated Talk: Old Germanic Musical Instruments. **5.45,** Time and Announcements. **6.0,** Transmission for all German Stations, relayed from **Heilsberg. 7.0,** Programme to be announced. **8.0.** Political Address. **8.20,** New Viennese Musical Comedy—Extracts with Commentary **9.0,** Time and News.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres, Rjukan, 671 kc/s, 447.1 metres,** and **Jelöy (LCL), 6,990 kc/s, 42.92 metres.—4.0 p.m.,** Concert relayed from the Hotel

Britannia, Tröndelag. 5.0, French Lesson. 5.30, Talk: Are you Superstitious? 6.0, Announcements, Weather and News. 7.0, Time Signal. 7.1, Concert by the Philharmonic Orchestra, conducted by Harald Heide. Soloist: Helga Lökke (Violin). Spanish Caprice (Rimsky-Korsakov); Pan and Syrinx (Nielsen); Violin Concerto in B minor (Saint-Saëns); Rondo infinito (Sinding). 8.30, Agricultural Report, Weather and News. 9.0, Topical Talk. 9.15, Variety Programme. 9.45 (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Talk, Agricultural Notes, Report of the Royal Geographical Society and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.30,** Time and Announcements. **7.45,** Symphony Concert, conducted by Armando la Rosa Parodi. Soloist: Lea Tumbarello Mulè (Pianoforte); Pianoforte Concerto in E Flat (Liszt); Summer Concerto (Pizzetti); Symphony Poem, Don Juan (R. Strauss). In the interval: Talk. After the Concert: Light Music on Gramophone Records. **10.0,** Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.15,** Weather. **7.25,** News. **7.30,** Pianoforte Recital with Commentary: Twelve Mazurkas (Chopin). **8.0,** Political Review. **8.15,** Orchestral Concert, conducted by Flament; Soloists: Charon (Violin), Manouvrier (Flute), and Marchesini (Cello); Sicilienne (Bach); Bourrée (Bach); Violin Solos; Dans les cytises (Flament); Flute Solos; Albumblatt (Wagner); Serenade, L'amant jaloux (Grétry); 'Cello Solos; Slav Dances (Dvorak). **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Gramophone Music. **7.5,** Sponsored Talk. **7.15,** Le Journal Parlé. **7.30,** Extracts from the Sonata for Violin and Pianoforte (Franck), by Lucien Bellanger and Maurice Béché. **7.55,** Review of the week. **8.0,** Talk on Music. **8.10,** Interval. **8.30,** Fortunio, Opéra-Comique in Three Acts (Messager), on Gramophone Records. **10.30,** News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture (contd.). **7.45,** Gramophone Music. **8.0,** Press Review and News. **12 Noon,** Jewish Talk. **12.30,** Gramophone Concert: Overture, The Secret Marriage (Cimarosa); Eglogue (Raboud); Alborada del gracioso (Ravel); Le rouet d'Omphale (Saint-Saëns); Les chants de la mer (Gaubert); Overture, Ramuntcho (Pierné); Marche écossaise (Debussy); Selection from The Love of the Three Oranges (Prokoffev). In the interval at **1.0,** Exchange, News, and Weather, and at **1.30,** Exchange. **2.0,** Exchange and Announcements. **3.45,** Exchange and Market Prices. **4.30,** Elementary English Lesson. **6.20,** Agricultural Talk. **6.45,** Report of Social Assurance Societies. **7.0,** Book Review. **7.20,** Gramophone Music: Moi je n' fiche rien (Borel-Clerc); Pluie de roses (Avignon); Leila (Dauber); Les papillons de nuit (Gabaroche); Sautez bébés (Paradis). **7.35,** Popular Music: Madrid (Alex); Je sais que vous êtes jolie (Christiné); Fleche d'or (Vacher); Deux guitares (arr. Weismann); En avant (Mateo). **7.50,** Commercial Notes and News. **8.0,** Readings. **8.30,** News and Weather. **8.40,** Gastronomic Talk. **8.45,** The Proposal—Play (Tchekov). In the interval at **9.15,** Press Review and News. **9.30,** Piano Recital by Jean Doyen. **10.0,** Variety Programme. Part I—Recitations to Music; Part II—Gramophone Music.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on **48.86 metres** and **25.27 metres.**—**7.0 p.m.,** Musical Originalities, from **New York.** **7.30,** KDKA Home Forum. **8.0 to 9.30, New York** Relay. **8.0,** U.S. Marine Band. **9.0,** Betty and Bob. **9.15,** Gene Quaw's Orchestra. **9.30,** News and Market Reports. **9.45,** Variety Programme. **10.0,** Uncle Tom and Betty. **10.15,** KDKA Kiddies' Klub. **10.30,** The Singing Lady, from **New York.** **10.45,** Orphan Annie, from **New York.** **11.0,** News-Reeler, Pat Haley. **11.15,** Sports and Programme Preview. **11.30,** Evensong. **11.45,** Lowell Thomas, from **New York.** **12 Midnight,** Amos 'n' Andy, from **New York.** **12.15 a.m. (Saturday),** The Silver Toppers. **12.30 to 3.30, New York** Relay. **12.30,** Potash and Perlmutter. **12.45,** Irene Rich for Welch. **1.0,** Popular Programme. **1.30,** Dangerous Paradise. **1.45,** Red Davis. **2.0,** Let's listen to Harris. **2.30,** Variety Programme. **3.0,** The Iron Master.

PORSGRUND.—See **Oslo.**

PRAGUE

314 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.,** See **Brno.** **3.55,** Talk. **4.5,** See **Bratislava.** **5.5,** Agricultural Talk. **5.15,** Talk for Workers. **5.25,** News in German. **5.30,** German Transmission—Talk: The Electrification of the Railways. **6.0,** Time, News and Weather. **6.10,** English Conversation Lesson. **6.25,** Topical Talk. **6.40,** Saxophone Recital by Vilem Fleischhans: Aria from La Juive (Halévy); Aria from Eugene Onegin (Tschaikovsky); Aria from In the Well (Blodek); Ave Maria (Gounod); Humoresque (Potuznik); Aria from Roussalka (Dvorak). **6.55,** Talk: The Yugoslav National Holiday. **7.5,** Concert for the Yugoslav National Holiday, relayed from the Smetana Hall. **7.40,** Recital of Modern Yugoslav Poetry. **8.10,** Concert of Yugoslav Music by the Station Orchestra, conducted by Otakar Parík. **9.0,** Time, News, Review of the Day, and Sports Notes. **9.15,** News in Russian. **9.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW; and **Geneva, 400 kc/s, 749.9 metres.—6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28,** Time Signal from Neuchâtel Observatory. **11.30,** News and Weather. **11.40** (from **Geneva**), Gramophone Concert. **12 Noon** (from **Geneva**), Financial Notes. **12.10 p.m.** (from **Geneva**), Gramophone Concert (contd.). **1.0,** Interval. **2.58,** Time Signal from Neuchâtel Observatory. **3.0,** See **Schweizerischer Landessender.** **5.0** from **Geneva**), Programme for Women. **5.30** (from **Geneva**). Esperanto Lesson. **5.40** (from **Geneva**), English Lesson. **6.5** (from **Geneva**), Talk for Bridge Players. **6.20** (from **Geneva**). Talk for Chess Players. **6.35** (from **Geneva**), Illustrated Talk: Newly-released Gramophone Records. **6.59** (from **Geneva**), Weather Report. **7.0** (from **Geneva**), Concert of Modern Chamber Music by the Klein Quartet. **7.40** (from **Geneva**), Humorous Programme. **7.55** (from **Geneva**), Cabaret Programme. **8.50,** News and Weather. **9.0** (from **Geneva**). Report of the Touring Club and Road Report. **9.10** (from **Geneva**), Answers to Correspondence. **9.30** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.1 metres,** from **7.15 p.m.;** and **2RO, 11,810 kc/s, 25.4 metres.—12 Noon to 1.15 p.m.,** Orchestral Concert. In the intervals from **12.30 to 12.45,** Giornale Radio and Exchange, and at **1.0,** Time and Announcements. **3.0,** Song Recital by Bidu Sayao (Soprano), relayed from the Royal Academy of Saint Cecilia. **5.40 (Naples),** Shipping and Sports Notes. **5.45,** Dopolavoro and Tourist Reports. **5.57,** Report of the International Institute of Agriculture (in Spanish, German and French). **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Giornale Radio. **7.0,** Time, Announcements and Sports Notes. **7.15,** Sponsored Concert. **8.15,** La giornata di Marcellina—Opera in Three Acts (Attilio Parelli). Talk and News in the intervals. Giornale Radio after the Opera.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.—7.30 p.m.,** Friday Steeplechase, from **New York.** **8.15 to 8.30** (approx.), Georgia Wildcats. **12.45 a.m. (Saturday)** Trials of the Goldbergs, from **New York.** **1.0,** Cities Service Programme, from **New York.** **1.30,** Popular Programme. **2.0 to 4.0, New York** Relay. **2.0,** Variety Programme. **3.0,** First Nighters. **3.30,** Popular Programme. **4.0,** Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—5.50 a.m. to 6.5** (from **Zürich**), Ski-ing Lesson. **11.0** (from **Basle**), The Don Cossack Choir (on Gramophone Records). **11.29,** Time Signal from the Neuchâtel Observatory. **11.40** (from **Bale**), Music by the Alexandrov Balalaika Orchestra. **12.25 p.m.** (from **Basle**). Time, Weather and Exchange. **2.30** (from **Basle**), Talk: The School Child. **3.0** (from **Zürich**), Folk Music of the Argentine, Chile, Peru and Mexico. **3.30,** Concert by the Station Orchestra. **4.0,** Gramophone Records. **4.10,** Concert of Viennese Music by the Small Station Orchestra, conducted by Scherbaum. **5.0** (from **Zurich**), Gramophone Concert. **5.30** (from **Berne**), Programme to be announced. **6.0** (from **Berne**), Time, Weather, Exchange, Tourist Report and Winter Sports Notes. **6.25** (from **Berne**), Popular Concert. **7.5** (from **Berne**), Dialogue. **7.35** (from **Berne**), Variations and double Fugue on a Theme of Bach (Reger), played by Franz Josef Hirt. **8.0,** Weather and News. **8.10** (from **Berne**), Programme to be announced. **9.15** (from **Berne**), Dialect Programme. **9.25** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.—12 Noon to 12.25 p.m.,** Broadcast for Schools, relayed from **Malmö, 1,301 kc/s (230.6 metres).** **4.5,** Swedish Boy Scouts' Report. **4.25,** Accordion Music. **4.45,** The Practical Corner. **5.0,** Gramophone Music. **5.55,** Talk on Foreign Politics. **6.15,** Weather and News. **6.30,** Songs from Operetta. **6.50,** Talk. **7.0,** Concert by the Students' Choral Society, conducted by Einar Ralt, relayed from The Academy of Music. **7.45,** Literary Discussion. **8.45,** Weather and News. **9.0,** Concert by the Göteborg Chamber Orchestra, conducted by Tor Mann: Soloist: John Järnberg (Violin); Symphony No. 3 in C (Bach); Violin Concerto No. 2 in G Minor (Vivaldi); Angelus (Liszt); Serenade for Strings, Op. 20 (Henneberg). **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.,** Gramophone Concert. **12.45 p.m.,** News. **1.0,** Time and Exchange. **1.5,** Gramophone Music. **2.0,** Interval. **4.45,** Talk on Literature: Marie Bashkirtzev. **5.0,** Concert by the Station Orchestra, conducted by Roskam: Overture, A Night in Venice (Joh. Strauss); Waltz, Ange d'amour (Waldteufel); Viola Solo; Selection from La Bohème (Puccini); Song (Schubert); Ave Maria (Schubert); Berceuse and Entr'acte from Don César de Bazan (Massenet); Selection from The Last Waltz (O. Straus). **6.0,** Trio Concert, relayed from **Lille, 1,128.5 kc/s, 265.8 metres.** **7.0,** Topical Talk in German. **7.15,** Talk in German: Franco-German Trade. **7.30,** Time and News. **7.45,** Gramophone Music. **8.0,** Press Review in German, Lottery Results, and Announcements. **8.30,** Orchestral Concert; Soloists, Hastin (Baritone), Pagoda (Pianoforte), and Jean Weber (Saxophone): Overture, The Thieving Magpie (Rossini); Pianoforte Solo: Scherzo in B minor (Chopin); Selection from Lakmé (Delibes); Songs: (a) Serenade from Milenka (Blockx), (b) Tes yeux (Rabey), (c) Tout doucement (de Fontenailles); Song of the Bees (Filipucci); Orientale for Saxophone and Pianoforte (Spoerck); Melodies from White Horse Inn (Stolz); Songs: (Grabbe); (a) Dans ton miroir, (b) Rubbia, (c) Flemish Cradle Song; Song Foxtrot: Stay out of my Dreams (Washington-Petkere); Selection from No, No, Nanette (Youmans); Tango from White Horse Inn (Stolz-Benatzky); Song Foxtrot: Good evening, Mr. Nightingale (Pallack-Seymour); Intermezzo, Babil (Mommaert); Two-Step, Caramba (de Bozi). In the interval at **9.30** (approx.), Press Review in French. **11.30** (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.—12.15 p.m.,** See **Frankfurt.** **12.25,** Local News and Weather. **12.35,** See **Frankfurt.** **3.0,** Concert by the Small Station Orchestra, conducted by Schröder: Overture, Preciosa (Weber); Suite No. 1 from Carmen (Bizet): Strings and Harp: Romance (Schröder); Selection from Madame Butterfly (Puccini); Hungarian Rhapsody No. 11 (Liszt); Ballet Music from Sylvia (Delibes); Waltz, Wiener Blut (Joh. Strauss); Two Songs (Grieg): (a) Letzter Frühling, (b) Herzwunden; Rhapsody on Swabian Folk Songs (Kämpfert). **5.0 to 5.35,** See **Langenberg.** **5.35,** Legal Talk. **5.45,** Time and Announcements. **6.0,** Transmission for all German Stations, relayed from **Heilsberg.** **7.0,** See **Frankfurt.** **7.10** See **Langenberg.** **9.0,** See **Frankfurt.** **9.20,** Talk: Things you should know. . . **9.30,** Local News. **9.45** till Close Down. See **Frankfurt.** **12 Midnight** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.,** News. **6.15** Dance Music. **6.30,** Tourist Talk. **6.45,** Songs. **7.0,** Medical Talk. **7.15,** News, Exchange and Market Prices. **7.30,** Concerto in C minor for Harp and Orchestra (Renié). **7.45,** Accordion Solos. **8.0,** Operetta Music. Arias from Phi-Phi (Christiné), Fortunio (Messager), Les saltimbanques (Gaune) and Tip-Toes (Gershwin). **8.15,** Opera Music. Introduction and Entr'acte from The Tales of Hoffmann (Offenbach); Meditation from Thaïs (Massenet); Entr'acte from Carmen (Bizet); Selection from La Bohème (Puccini). **8.30,** Tango Songs. **8.45,** Light Music by a Viennese Orchestra. **9.0,** Concert of Opera Music. Overture, Le roi d'Ys (Lalo); Liberté O liberté ma mie, from Le jongleur de Notre Dame (Massenet); The Legend of Adamastor, from L'Africaine (Meyerbeer); Aria from I Pagliacci (Leoncavallo); Duet from Werther (Massenet); Aria from La Favorita (Donizetti); Gavotte from Mignon (Thomas). **9.30,** Orchestral Music. Danse des sylphes (Berlioz); Hungarian Dance No. 1 (Brahms); Selection from Schwanda the Piper (Weinberger). **9.45,** Music from Sound Films. **10.0,** Hawaiian Guitar Solos. **10.15,** News. **10.30,** Concert for Listeners in Morocco. Part I. Choral Music. Part II. Orchestral Music. **11.0,** Chansonnettes. **11.15,** Dance Music. **12 Midnight,** News, Weather and Announcements. **12.5 a.m. (Saturday),** Orchestral Music. Invitation to the Waltz (Weber); Carnaval romain (Berlioz); Jubel-Ouvertüre (Brahms). **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.,** Concert of Chamber Music: Carlo Kuhacevich (Violin), Bruno Bidussi (Pianoforte), Roberto Repini-Sesso ('Cello), and Corrado Valdisseri (Viola): Trio for Strings, Op. 38, No. 2 (Boccherini); Sonata No. 17 in A for Violin and Pianoforte (Mozart); Quartet in E Flat, Op. 47 (Schumann). **5.0** till Close Down. See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—4.10 p.m.,** Concert of Chamber Music. **5.0 to 5.5,** Weather. **5.40,** Giornale Radio, Dopolavoro Report and Gramophone Music. **6.0,** Time, Report of the Royal Geographical Society, and Gramophone Music. **6.10,** Wheat Market Report. **6.20,** News in Foreign Languages. **6.40,** Gramophone Music. **7.0,** Giornale Radio and Weather. **7.15,** Gramophone Music. **7.30,** An Operetta in Three Acts. Talk and News in the intervals. Giornale Radio after the Operetta.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.,** Religious Information in German. **7.0 to 7.15 p.m.,** Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 622 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m.,** Orchestral Concert, conducted by Gustav Macho. In the interval at **10.55,** Weather. **12 Noon,** Time and News. **12.10 p.m.,** Famous Artists on Gramophone Records. **1.0,** Interval. **2.0,** Time and Exchange. **2.15,** Programme for Children. **2.40,** Gramophone Concert by the Jaroff Don Cossacks Choir. **3.35,** Programme for Women. **3.55,** Talk: The Italian Theatre. **4.15,** Reading (Eybner). **4.25,** Soprano Song and Aria Recital by Olga Kalliwoda. **4.55,** Tourist Report. **5.10,** Talk on Ski Jumping. **5.25,** Sports Notes. **5.35,** Talk: An Austrian Reformatory for Young People. **6.0,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. In an interval at **6.35,** Time and Announcements. **7.5,** Readings. **7.45,** Snow Report. **7.55,** Concert by the Wiener Symphoniker, conducted by Carl Alwin. Soloist: Anton Kamper (Violin): Overture, Der Schauspieldirektor (Mozart); Violin Concerto in G (Mozart); Four Symphonic Entr'actes from Intermezzo (R. Strauss); Chamber Suite for Sixteen Instruments (Salmhofer); Symphonic Poem, Mazeppa (Liszt). **9.0,** Topical Talk. **9.15,** News. **9.30,** Concert of Light Music by the Four Funny Fellows, relayed from the Oase. After the Concert, Announcements.

WARSAW

212.5 kc/s, 1,411 metres 120 kW.—**10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5,** Orchestral Concert, conducted by Raczynski. **11.30,** Radio Journal. **11.35,** Weather. **11.38,** Orchestral Concert (contd.). **12 Noon,** Interval. **2.25,** News and Economic Notes. **2.40,** Dance Music on Gramophone Records. **3.10,** Vocal Duets by Jeanne Slonska (Mezzo-Soprano) and Lilian (Soprano). **3.40,** Book Review. **3.55,** Instrumental Concert: André Kalinowsky (Clarinet) and Rosenbaum (Pianoforte). Clarinet and Pianoforte: Sonata in F minor, Op. 130 (Brahms); Pianoforte Solos: (a) Intermezzo in E flat minor (Schumann), (b) The Miller and the Stream (Schubert-Liszt), (c) Capriccio in B minor (Brahms), (d) Mazurka in E flat minor (Chopin), (e) Nocturne in E (Chopin); Air and Gigue (Leclair); Five Pieces (Debussy): (a) La fille aux cheveux de lin, (b) Petite Pièce, (c) Arabesque No. 2, (d) Valse triste, (e) La coquette. **4.50,** Agricultural Talk. **5.20,** Orchestral Concert. **6.0,** Programme Announcements. **6.5,** Miscellaneous Announcements. **6.20,** Talk: Suggestions for Holidays. **6.25,** Topical Talk. **6.40,** Sports Notes. **6.47,** Radio Journal. **6.55,** Interval. **7.0,** Talk on Music. **7.15,** Concert by the Philharmonic Orchestra and the Chlopicki Viennese Choir. Part I—Abu Hassan—Comic Opera (Weber). Part II—Choral Songs. In the interval at **8.0,** Literary Talk. **9.40,** Dance Music by the Henri Gold Band, relayed from the Femina Cabaret. In an interval at **10.0,** News.

ZURICH.—See **Schweizerischer Landessender.**

DEC. 1st **FRIDAY** *continued*

SATURDAY

DECEMBER THE SECOND

ALGIERS

825.5 kc/s, 363.3 metres; 13 kW.—**7.0 p.m.,** Financial Notes. **7.10,** Shipping Notes. **7.15,** Agricultural Notes and Weather Report. **7.20,** Operetta Arias. **7.55,** News. **8.0,** Time Signal. **8.2,** Concert by the Station Orchestra. Overture Alessandro Stradella (Flotow); Waltz (Hollaender); La jolie Persane (Lecocq); Jeux de naiades (Dargel); En Bretagne (Rhené-Baton). In the interval at **8.30,** News and Light Music. **9.30,** News. **9.35,** Recitations. **9.55,** News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by **Dublin, 1,382 kc/s, 217 metres,** and **Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m.,** Time Signal, Weather Report, Stock Report and Gramophone Concert. **6.0,** Gramophone Concert. **6.45,** News. **7.0,** Val Vousden, Entertainer. **7.15,** Gaelic Talk. **7.30,** Time Signal. **7.31,** Concert by the Station Orchestra. **8.0,** Flute Solos by M. Ahearn. **8.10,** Pianoforte Solos by Violet Mackinnon. **8.25,** The Station Orchestra. **8.40,** 'Cello Recital by Madeline Monier. **9.0,** Mezzo-Soprano Solos by Elizabeth Downey. **9.15,** 'Cello Recital (contd.). **9.30 to 10.30,** Programme by the I.B.C. (Ireland), Ltd. **9.30,** Light Music; Madrid (Rotter); Valse Caprice (Rubinstein); After the Ball (Harris); Pierrette's Wedding (Jordon); Yip-I-addy-I-ay (Flynn); Violin Solo: Valse bluette (Drigo); Selection from The Maid of the Mountains (Fraser-Simson). **10.0,** Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Dance Music; Learn to Croon; Stay out of my Dreams; Hold me; Racing Commentary; I cover the Waterfront; Really Mine; My Moonlight Madonna; Mississippi Basin. **10.30,** I.B.C. Good-night Melody, followed by News and Weather. **10.40,** Accordion Solos by Terry Lane. **10.50,** Pipe Solos by Liam Andrews. **11.0** (approx.), Close Down.

BARCELONA

EAJ1, 858 kc/s, 349.6 metres; 8 kW.—**7.0 p.m.,** Request Gramophone Music. In the interval at **7.30,** Exchange. **8.0,** Gramophone Music. **8.15,** Anti-War Talk, followed by News. **9.0,** Chimes, Weather, Exchange and Market Prices. **9.5,** Educational Programme. **9.35,** Concert by the Radio Orchestra: March (Freitag); Schatzwalzer (Joh. Strauss); Minuet (Torrandell); Caprice viennois (Kreisler); Piece for Violin (Cols); A Song of Autumn (Elgar); Gavotte (Hummel). **10.0,** Two Plays (Apeles Mestres): (a) La Sirena, (b) La Barca dels afligits. In the interval at **11.0,** News. **12 Midnight** (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW.—**3.30 p.m.,** Programme for Children. **3.55 to 7.0,** See **Rome. 7.0,** News in Albanian. **7.15** till Close Down, See **Rome.**

BASLE.—See **Schweizerischer Landessender.**

BELGRADE

698 kc/s, 429.7 metres; 2.8 kW.—**6.0 p.m.,** Talk. **6.30,** Volin Recital. **7.10,** Variety Concert. **9.15,** Time and News. **9.30** (approx.), Relay of Foreign Stations.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—**1.0 p.m.,** Gramophone Concert of Operetta Music. **2.0,** Handwork Programme for Children. **2.30,** Weather and Exchange. **2.45,** Talk: The History of Flying. **3.0,** See **Heilsberg. 4.0,** Sports Notes. **4.20,** Concert by Robert Gaden and his Orchestra. **5.0,** Poems. **5.5,** Small Advertisements—Great Results—Humorous Scene with Music. **5.45,** Chimes from Breslau Cathedral. **5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** To-day's Motto. **7.10,** See **Breslau. 9.0,** News and Weather. **9.30,** Talk: Winter Sport Competitions for 1934. **9.45,** Weather. **10.0,** See **Langenberg. 11.0,** Dance Music. **11.30** (approx.), Close Down.

BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW. Relayed by **Zeesen, DJC, DJA, DJD, DJB,** and **DJE.—3.0 p.m.,** See **Heilsberg. 4.0,** Concert of Chamber Music: Pianoforte Trio in G (Haydn); Three Songs (Schubert): (a) Dem Unendlichen, (b) Suleika, (c) Wohin; Andante un poco mosso from the Pianoforte Trio in B flat, Op. 99 (Schubert); Three Songs (Schumann): (a) Waldesgespräch, (b) Der Nussbaum, (c) Sonnenschein; Quartet for Flute, Violin, Viola, and 'Cello (Mozart). **5.0,** Lecture Recital; Discussion on Italian and German Opera by an Italian Music Critic and Nina Alfi; Recital of Italian and German Arias by Lotte Schönauer and Garavello. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.5,** Concert by the Station Orchestra, conducted by Helmuth Theirfelder; Soloists, Gertrud Baumann (Soprano) and Herbert Ernst Groh (Tenor): Prelude to Act II of Ingwelde (Schillings); Soprano Aria from Undine (Lortzing); Three Pieces for Orchestra; Capriccio, Gavotte, and Tarantella, Op. 87 (Klughardt); Tenor Aria, Prayer from Alessandro Stradella (Flotow); Neapolitanischer Mandolinenspieler, Op. 86 (Reinecke); Duet from The Barber of Bagdad (Cornelius); Overture, The Italian Girl in Algiers (Rossini); Tenor Aria from The Barber of Seville (Rossini); Intermezzo from L'amico Fritz (Mascagni); Flower Aria from Carmen (Bizet); Entr'acte from Carmen (Bizet); Two Tenor Arias from Tosca (Puccini); Extracte and Duet from Madame Butterfly (Puccini); Overture, The Force of Destiny (Verdi). **9.0,** Weather and News. **9.15** (approx.), Dance Music by the Berlin Dance Band, relayed from the Delphi Palast. **12 Midnight** (approx.), Close Down.

BERNE.—See **Schweizerischer Landessender.**

BEROMUNSTER. — See **Schweizerischer Landessender.**

BODEN.—See **Stockholm.**

BODO.—See **Oslo.**

BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—**7.0 p.m.,** Radio Journal. **7.55,** Sports Talk. **8.0,** News, Racing Results and Market Prices. **8.5,** English Lesson. **8.20,** News. **8.30,** Martha—Opera (Flotow), relayed from **Paris (Ecole Supérieure), 671 kc/s, 447.1 metres.**

BRATISLAVA

1,073 kc/s, 279.5 metres; 14 kW.—**5.30 p.m.,** Gramophone Music. **5.45,** Topical Talk. **5.55,** Hints for Housewives. **6.0,** See **Prague. 6.25,** Violin Recital of Norwegian Music by Henri Marteau: Sonata for Violin and Pianoforte (Johansen); Sanctus Dolores (Sinding). **7.15,** A Radio Play. **7.40,** Variety Programme: Part I, Potpourri of Popular Music (Silving), by the Station Orchestra, conducted by Dyk; Part II, Humorous Reading; Part III, The Sinner, Operetta in One Act (Pecke). **9.0,** See **Prague. 10.30** (approx.), Close Down.

BREMEN.—See **Hamburg.**

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by **Gleiwitz, 1,185 kc/s, 253.1 metres.—1.10 p.m.,** Gramophone Music. **1.40,** Programme arranged by the Post Office, with Gramophone Records. **2.0,** Agricultural Prices. **2.35,** Programme Announcements for the Coming Week. **2.45,** Film Review. **3.0,** Concert by the Eduardo Andreozzi Orchestra, relayed from the Vier Jahreszeiten Café. **4.35,** Talk: The Next Tasks of Science. **5.0,** A Discussion between a German and an Italian Boy. **5.20,** Programme to be announced. **5.45,** Programme Announcements. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** News. **7.10,** Ein Walzer muss es sein—Musical Play about Johann Strauss and Joseph Lanner (Rolf Herbert Kunze). **9.0,** Time and News. **9.30,** Dance Musik, relayed from **Berlin (Funkstunde). 12 Midnight** (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—**5.25 p.m.,** German Transmission: News and Song Recital by Lia Kroupa (Soprano) and Anni Balzer (Contralto). **6.0,** See **Prague. 6.25,** Brass Band Concert. **7.15,** Concert of Old Chamber Music. **7.40,** See **Bratislava. 9.0,** See **Prague. 10.30** (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 589 kc/s, 509.2 metres; 15 kW.—**12 Noon,** Concert by the Station Orchestra, conducted by Pierre Leemans: Overture, The Barber of Seville (Rossini); Suite, At the Circus (Armandola); Liebestraum (Liszt); Selection from Samson and Delilah (Saint-Saëns); Violin Solo: Polonaise (d'Agréves); Ballet Music from Herodiade (Massenet); Dances from Tom Jones (German). **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Primas Sylva Orchestra: Rakoczy March; Waltz, Mannequin (Montague); Selection from The Merry Widow (Lehár); Czardas from Mariska (Lehár); Waltz, Neu Wien (Joh. Strauss); March (Ertl); Parlez-moi d'amour (Lenoir); Romanian Song and Dance (Sylva); Two Guitars (arr. Salabert); Livonia (Barch); March (Fucik). **4.45,** Talk: The Protection of Birds in Winter. **5.0,** Concert by the Radio Orchestra, conducted by Walpot. Soloist: Lombard (Vibraphone). Italian March (Sellenick); Potpourri of Viennese Waltzes (Gilson); Overture, The Secret Marriage (Cimarosa); La Lettre à Manon (Gillet); Mendelssohn Potpourri (arr. Urbach); Vibraphone Solo: Where my Caravan has Rested (Löhr); Italian Caprice (Tchaikovsky). **6.0,** Talk on Bull-fighting. **6.15,** Gramophone Music. **6.30,** 'Cello Recital by Pitsch: Sonata in F (Porpora); Elegiac Song (Scharrès); Improvisation on two Irish Airs (Hahn); Symphonic Variations (Boellmann). **7.5,** Gramophone Records: Selection from La Serva padrona (Pergolesi); Symphonic Variations (Franck). **7.30,** Le Journal Parlé. **8.0,** Concert by the Radio Orchestra, conducted by Walpot. Soloist: Mlle. Duchatelet (Songs): Potpourri of Soldiers Songs (Salabert); Overture, Poet and Peasant (Suppé); Selection from Rose-Marie (Friml); Songs; Polka-Fantasia for Clarinets, La Chanson des Nids (Buot). **8.45,** Talk: The Belgian Author, Edward Ewbank, with Readings from his Works. **9.0,** Concert (contd.): Waltz Potpourri, No. 2 (Robrecht); Selection from Viktoria and Her Hussar (Abraham); In the Temple of the Bells (Yoshitomo); Songs; Hungarian Rhapsody No. 2 (Liszt); Suite de Ballet (Popy). **10.0,** Le Journal Parlé. **10.10,** Dance Music by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp.

BRUSSELS (No. 2)

N.I.R., 888 kc/s, 337.8 metres; 15 kW. Programme in Flemish.—**12 Noon,** Concert by Primas Sylva and his Orchestra. **1.0 p.m.,** Le Journal Parlé. **1.10,** Concert by the Station Orchestra, conducted by Pierre Leemans. **5.0,** Concert by Robert de Kers and his Cabaret Kings, relayed from the Century Hotel, Antwerp. **6.0,** Allegro con brio and Theme with Variations from the Sonata in D, Op. 12, No. 1 (Beethoven), on Gramophone Records. **6.15,** Talk: Flemish Literature as seen by a Dutchman. **6.30,** Concert by the Small Station Orchestra, conducted by Leemans: Overture, Cigale et Magali (Casadesus); Petite Suite (Busser); Barcarolle, Sur l'étang bleu (Gaillard); Selection from Adriana Lecouvreur (Cilèa); Ariette for 'Cello (Martinu); Selection from Fleur de thé (Lecocq); Vision (Drdla); Waltz, Sphinx (Popy); Potpourri, Frühling im Wienerwald (Ascher). **7.30,** Agricultural Report. **8.0,** La Traviata—Opera (Verdi), relayed from the Royal Opera House, Antwerp. In the intervals, Recitations, Gramophone Music, and Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—**4.0 p.m.,** Dance Music by the George Korologos Jazz Band. In the interval at **5.0,** Radio Journal. **6.0,** Educational Talk. **6.20,** Gramophone Music. **6.45,** Talk. **7.0,** String Quartet (Chausson). **7.30,** Answers to Correspondence. **7.45,** Song Recital by Olga Hoch. **8.15,** Musical Saw Solos by Galperini: The Lark (Glinka); Berceuse (Godard); Melody (Harito); Romance (Leon). **8.45,** Radio Journal. **9.0,** Romanian Music by the Station Orchestra.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on **840 metres** from **7.0 p.m.** till Close Down.—**4.30 p.m.,** Recital of Hungarian Folk Songs by Josef Cselenyi, with Cigány Music Accompaniment. **5.30,** Talk. **6.0,** Concert by the Losonczi Schweitzer Orchestra. Overture, Norma (Bellini). Song: Apple Blossom (Losonczi Schweitzer); Potpourri, Pudding (Morena). **6.30,** The Letter Box. **7.0,** Opening Ceremony of the New Budapest High Power Broadcasting Station.

CASSEL.—See **Frankfurt.**

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by **Kalundborg, 260 kc/s, 1,153.8 metres,** and **Skamlebaek, OXY, 49.4 metres.—11.0 a.m.,** Time Signal and Chimes from the Town Hall. **11.15,** Broadcast for Schools. **11.45,** Concert by the Bendix String Ensemble, relayed from the Wivex Restaurant. **1.0 p.m.,** Interval. **2.0,** Concert by the Louis Preil Instrumental Ensemble. Two Pieces (Myddleton): (a) Patsy, (b) The Swanky Drum Major; Serenata amorosa (Bridgewater); Southology (Sander); Suite of Viennese Waltzes (Gilson); Selection from Good News (Sylva, Brown and Henderson); Nixengeflüster (Heykens); Gallop (Krüger); Dolly Dimples (Alter); Intermezzo, Sag mir, wer du bist (Grothe); Negro Rhapsody (Johnson); Flower Song (Schröder); Mignonette (Poczy); Waltz (Moe); Intermezzo (Demaret); Two-Step, Seville (Alfonso). In an interval at **2.45,** Readings from the Jutland Writer, Kjerup. **4.0,** Gramophone Concert of Variety Music. **4.30,** Exchange and Fish Market Prices. **4.45,** Talk: The Development of the Waltz. **5.15,** French Lesson. **5.45,** Weather. **5.54,** Announcements. **6.0,** News. **6.15,** Time Signal. **6.30,** Talk on Music. **7.0,** Time Signal from the Town Hall. **7.1,** Concert of Seventeenth-Century German Music, by the Radio Chamber Orchestra, conducted by Fritz Mahler. Concerto grosso No. 2 in A (Muffat); Suite, Tafelmusik (Telemann). **7.25,** Talk and Reading from Holberg's Epistles. **8.0 to 10.0,** Variety Programme. **8.0,** Johann Strauss Concert by the Radio Orchestra, conducted by Fritz Mahler. Waltz, Künstlerleben; Polka, Tritsch-Tratsch; Persian March; Waltz, O schöne Mai; Overture, The Queen's Kerchief. **8.30,** Song Recital by Ely Fischer Kjerulf. **8.50,** Banjo Solos, by Edwin Taaning. **9.5,** News. **9.20,** Concert of Operetta Overtures by the Radio Orchestra, conducted by Fritz Mahler. Overtures to Fatinitza (Suppé), Madame Favart (Offenbach), The Mikado (Sullivan), and A Waltz Dream (O. Straus). **9.45,** Improvisations by Axel Boesen. **10.5,** Dance Music by the Otto Lington Band, relayed from the Ritz Restaurant. In an interval at **11.0,** Time Signal and Chimes from the Town Hall. **11.15** (approx.), Close Down.

CORK.—See **Athlone.**

DANZIG.—See **Heilsberg.**

DRESDEN.—See **Leipzig.**

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—**11.0 a.m. to 12 Noon,** Programme in English by the I.B.C. **11.0,** Happy Hour. Part I: Orchestral Concert. Signature Tune; March from La Czarine (Ganne); Song, How deep is the Ocean? (Berlin); Veleta Medley (Varney); Pianoforte Solo: Selection from Waltz Time (Strauss); Little Yvonne (Schwartz); Selection from Give me a Ring (Broones); Song: Black Moonlight (Coslow); Pride of the Wolfcrines (Sousa). Part 2: Dance Music. Dear Stranger; Pettin' in the Park; Love in the Moonlight; I've got you on my Mind; A Couple of Pals; A Couple of Fools in love; Symphony of the Breeze; One Horse Town. **12 Noon,** French Programme. **3.30 to 6.0 p.m.,** Programme in English by the I.B.C. **3.30,** Accordion Band Music; The Best of the Bunch (Alexander); Valse la Reine (Alexander); Dinah (Lewis); Melody (Alexander); Cocktails (Cuvelier); Milano (le Clerc); By the Shimmering Twilight Sea (Williams); Accordion Joe (Wimbrow). **4.0,** Dance Music: Signature Tune: The Bells of Normandy; Egypt; Who's afraid of the Big Bad Wolf?; Ah, but it's love; My Moonlight Madonna; Well done, Gordon; A couple of Fools in love; Si, Si; Oh, Johanna; Signature Tune: The Bells of Normandy. **4.30,** The I.B.C. Nursery Corner. Birthday Greetings; Trumpets. **4.40,** Concert of Light Music for Tunbridge Wells and Isle of Thanet Listeners: Trumpets; Signature Tune: The Night by the Sea; Waltz from The Gipsy Princess (Kálmán); The Coon among the Chickens (Ives); Dainty Lady (Leo Peter); Second Serenade (Heykens); Waltz Medley (arr. Simpkin); Whispering Flowers Idyll (von Blon); In Vienna One Night (Bordin); Smilin' through (Penn); Play of Butterflies (Heykens); Selection from Give me a Ring (Broones). **5.20,** Concert of American Songs for Dover and Folkestone Listeners. Trumpets; That Lindy Hop (Kazag); Fortunes Galore; Hallelujah, I'm a Bum (McClintock); The Whistler and his Dog (Pryor); Smoky Mountain Bill (Robinson); The Railroad Boomer (Reeves); The Warbler's Serenade (Perry). **5.45,** Concert of Dance Music: Sing another Linc (Carson); Aloha Oe (Lilioukalani); I'll take an Option on you (Rainger); Wood Violets (Fetras). **6.0,** French Programme. **11.0,** Talkie Time: Tunes from the Talkies and Shows. Signature Tune: Sittin' in the Dark; Selection from College Humour (Coslow); A Glass of Golden Bubbles (Strauss); But for you (Hollander); She's Everybody's Sweetheart now (Hargreaves); Selection from He wanted Adventure (Waller); In a Year, in a Day (Heymann); Thanks (Coslow); Heaven will protect an Honest Girl (Weston); Signature Tune. **11.30,** Concert arranged by the International Broadcasting Company (Ireland), Ltd. Signature Tune: Come back to Erin; Pan and the Wood Goblins (Rathke); Rose mousse (Bosc); Selection from The Arabian Nights (Strauss); Minuet (Mozart); Pizzicato from Sylvia (Delibes); Lazy Pete (Werner); One Alonc from The Desert Song (Romberg); The Fairies' Gavotte (Kohn); Signature Tune. **12.5 a.m. (Monday),** Late News Bulletin in English. **12.10** (approx.), I.B.C. Club Concert for Llangammarch Wells Listeners: Signature Tune: The Chum Song; Smoke Rings (Gifford); Lazybones (Mercer); Cornflowers and Poppies (Waldteufel); Gipsy sing for me (Pola); Everyone loves my Marguerite (Woods); You're an Old Smoothie (Whiting); Selection from Dinner at Eight (Fields); Tick, Tock (Vienna); The Last Round up (Hill); Rosa Mia (Fisher); A Couple of Pals (Gilbert); Love in the Moonlight (Lewis); Don't blame me (Fields); Signature Tune. **1.0,** Dance Music: Signature Tune: The Bells of Normandy; Trouble in Paradise; Dear Stranger; The Wedding of Mr. Mickey Mouse; Sweet Dreams, Pretty Lady; Under a Blanket of Blue; At the Old Pig and Whistle; Aromas Mendocinas; I've told Every little Star; Wear a Great Big Smile; Dance, Pretty Lady; Little Nell; Tonight; Symphony of the Breeze; Moths around the Candle Flame; If you'll say Yes, cherie (Noble); Xinon (Moretti); Signature Tune: The Bells of Normandy. **2.0,** I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See **Hamburg.**

FLORENCE.—See **Turin.**

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by **Cassel** and **Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m.,** Time and News. **12.25,** Local News and Weather. **12.35 to 2.30,** See **Stuttgart. 2.30,** Weather. **2.40,** Time and Economic Notes. **3.0,** See **Langenberg. 5.0,** Talk: Frontier Problems. **5.20,** Review of the Week. **5.35,** Surprise Programme. **5.50,** Weather and News. **6.0,** Transmission for all German Stations, relayed from **Hamburg.**

7.0, Topical Talk. 7.10, Bunter Abend in Aid of the Winter Relief Fund, relayed from the Funkhaus. 9.0, Time and News. 9.20, See **Stuttgart.** 9.30, News. 9.45, Concert of Light Music. 10.0 till Close Down, See **Langenberg.** 12 **Midnight,** Close Down.

FREDRIKSSTAD.—See **Oslo.**

FREIBURG.—See **Stuttgart.**

GENEVA.—See **Radio-Suisse Romande.**

GENOA.—See **Turin.**

GLEIWITZ.—See **Breslau.**

GOTEBORG.—See **Stockholm.**

GRAZ.—See **Vienna.**

HAMAR.—See **Oslo.**

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by **Bremen, 1,112 kc/s, 269.8 metres; Flensburg** and **Hanover, 1,319 kc/s, 227.4 metres;** and **Kiel, 1,292 kc/s, 232.2 metres.**—**3.0 p.m.,** See **Heilsberg. 4.0,** See **Berlin (Funkstunde). 5.0,** Werner Beumelburg reads from his own Works. **5.25,** Military Programme. **5.40,** Radio Review. **5.50,** Weather. **6.0,** Transmission for all German Stations: Concert by the Hamburg Philharmonic Orchestra, conducted by José Eibenschütz: Jagd-Ouvertüre (Künneke); Dance Suite (Roters); Tarantella, Venezia e Napoli (Liszt); Heiteres Spiel (Blumer); North German Peasant Dances (Uldall); Waltz, Tales from the Vienna Woods (Joh. Strauss). **7.5 till Close Down,** See **Berlin (Funkstunde).** In an interval at **9.0,** Time and News. **12 Midnight** (approx.), Close Down.

HANOVER.—See **Hamburg.**

HEILSBERG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by **Danzig, 671 kc/s, 447.1 metres.**—**12.5 p.m.,** Gramophone Concert of Variety Music. In the intervals at **12.20** and **1.0,** News. **1.30,** Programme arranged by the Post Office with Gramophone Records. **2.0,** Agricultural Prices and Exchange. **2.30,** Programme for Girls. **3.0** (from **Danzig**), Concert by the Danzig Municipal Theatre Orchestra, conducted by Ernst Kallipke: Overture, Euryanthe (Weber); Soirées de Vienne (Schubert); Meditation from Thaïs (Massenet); Pizzicato Polka from Ritter Pasman (Joh. Strauss); Italian Serenade (Hugo Wolf); Selection from Die toten Augen (d'Albert); Dance Intermezzo (Sibelius); Waltz, Amorettantänze (Gungl); Norwegian Bridal Procession (Grieg); Hungarian Dances Nos. 1 and 2 (Brahms); Overture, Berherrscher der Geister (Weber). In the interval at **4.0** (approx.), Traffic Report. **4.45,** Lieder der neuen Front (Richard Trunk), to words by Baldur van Schirach, by the Tilsit Male Voice Choir, relayed from **Tilsit. 5.5,** Programme Announcements. **5.15,** Agricultural Prices. **5.25,** East Prussian Review of the Week. **5.50,** Weather. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** News. **7.10,** Langemarck, Radio Play (Meyer-Düwerth). **8.30,** Pianoforte Quartet, Op. 5 in E Flat (Louis Ferdinand, Prince of Prussia), by the Königsberg Chamber Music Society. **9.0,** News. **9.15** (approx.), Dance Music on Gramophone Records. **11.30,** (approx.), Close Down.

HILVERSUM

1,013 kc/s, 296 metres; 7 kW. up to **5.40 p.m. and** 20 kW. from **5.40 p.m.** Programme of the Workers' Radio Society (V.A.R.A.).—**11.55 a.m.,** Concert by the Small V.A.R.A. Orchestra conducted by de Groot: Turkish March (Mozart); Je t'aime (Waldteufel); Chinese Flirtation (Charmon); Wedding Day on Troldhaugen (Greig); Pastorale (Widor); Illusion (Heuschel); La cinquantaine (Gabriel Marie); Hearts and Flowers (Czibulka); Two Guitars (Horlick); Laura (Millöcker). **12.40 p.m.,** Orchestral Concert. **1.40,** Interval. **1.55,** Gramophone Music. **2.40,** Light Music by the V.A.R.A. Mandoline Orchestra. **3.10,** Talk. **3.30,** Orchestral Concert conducted by Horst: The Marseillaise (de l'Isle-Reunes); Selection from Schön ist die Welt (Lehár); Marionettes (Landschulz); The Birthday of Mr. Mickey Mouse (Meyers); Melody; Selection from The Vagabond King (Friml). **3.55,** Gramophone Music. **4.10,** Concert (contd.). **4.40,** Talk on the Cinema. **5.0,** Harpischord and Violin Recital by Gertrud Wertheim and de Klijn: Sonata in A (Bach); Gramophone Records; Sarabande and Allegretto (Senallié); Gavotte (Arne); Allegro (Fiocco). **5.40,** Talk on Literature. **6.0,** Organ Recital by de Jong, with Gramophone Interludes. **6.40,** Programme to be announced. **7.40,** S O S Messages, News and V.A.R.A. Notes. **7.55,** Concert by the V.A.R.A. Orchestra, conducted by de Groot: Selection from Hunyadi Laszlo (Ferencz); Die Werber (Lauer); Cossack Dance (Dargomyski); Ballet Music from Faust (Gounod). **8.40,** Talk. **8.50,** Songs to the Lute, by Monlijn. **9.10,** Concert (contd.): Im D-Zug (Blon); In Vlaanderen Vlaamsche Kermis (Blockx); Ca c'est Paris (Padilla); On the Riviera (Daniderv); Tyrolese Songs and Dances (Fetras); Grüss mir mein Wien (Kálmán); Constantinople (Carlton); On the Bosphorus (Lincke); In a Turkish Bazaar (Dreyer); Melody (Gray): We gaan naar Zandvoort (Davids); Hallo, hier Hilversum (de Groot). **9.55,** Gramophone Records. **10.10,** Concert (contd.): Entry March of the Gladiators (Fucik); Pikanterien (Lehár); In a Clock Store (Orth); Serenade (Heykens); Waltz: Potpourri (Robrecht); Marionetten Groteske (Dreyer); The Frog's Wedding (Beil); Melody (Ciere). **10.55,** Recitation. **11.0,** Organ Recital by Steyn. **11.40** (approx.), Close Down.

HORBY.—See **Stockholm.**

HUIZEN

160 kc/s, 1,875 metres; 7 kW. until **3.40 p.m.** Transmitted from **Kootwijk** on 50 kW. from **3.40 p.m.** Programme of the Catholic Radio Society (K.R.O.). **11.55 a.m.,** Concert by the K.R.O. Sextet, conducted by Lustenhopwer: Spanish March (Grit); Canzone di Maggio (de Michel) Der Himmel voller Geigen (Ziehrer); Melody (Ganglbertger); Russian Fantasia (Stabel); Impromptu (Schubert); Gramophone Records, Tempo, Tempo (Schootemeyer); Darling (Lincke); Selection from Lilac Time (Schubert Berté); Une Fête au Trianon (Popy); Was die Donau erzählt (Morena); Finale. **1.40,** Programme for Young People. **2.10,** Programme for Children. **3.40,** H.I.R.O. (Hebrew Radio Society) Programme. **4.40,** Writing Lesson. **5.10,** Esperanto Notes. **5.25,** Gramophone Music. **5.35,** Technical Talk. **5.50,** Gramophone Music. **6.0** Press Review. **6.25** Concert by K.R.O. Boys conducted by Lustenhouwer. **6.40,** Police Notes. **6.55,** Medical Talk. **7.15,** Concert (contd.). **7.40,** Gramophone Music. **8.0,** Songs by De Bossche Revellers. **8.10,** News. **8.15,** Concert by the K.R.O. Orchestra, conducted by van 't Wond: Festjubelmarsch (Blankenburg); Die Glocken von Prag (Fucik); Extase (Ganne); Her first Dance (Heykens); Waltz, Espana (Waldteufel). **8.40,** Recitations. **8.55,** Songs by De Bossche Revellers (contd.). **9.5,** Concert (contd.): Wien bleibt Wien (Schrammel); Dance of the Marionettes (Gilbert); Melody (Armandola); Selection from The Love Parade (Schertzinger). **9.30,** Gramophone Music. **10.0,** Songs by De Bossche Revellers (contd.). **10.30,** News. **10.35,** Concert by the K.R.O. Orchestra (contd.): American Patrol (Meacham); Les deux Rossignols (Rol); Berceuse de Jocelyn (Godard); The Wedding of the Rose (Jessel); March, Alte Kamaraden (Teike). **10.40,** Gramophone Music. **10.40** (approx.), Close Down.

INNSBRUCK.—See **Vienna.**

JUAN LES PINS

NICE, 1,205 kc/s, 249 metres; 0.8 kW. **8.0 p.m.,** Amusement Guide, Exchange and News. **8.10,** Cinema Review. **8.25,** Concert. **9.0** (in an interval), News and Weather.

KALUNDBORG.—See **Copenhagen.**

KIEL.—See **Hamburg.**

KLAGENFURT.—See **Vienna.**

KOSICE.—See **Prague.**

LANGENBERG

635 kc/s, 473 metres; 60 kW.—**12.15 p.m.,** See **Frankfurt. 12.25,** News. **12.35 to 2.30,** See **Stuttgart. 2.30,** Economic Notes. **2.45,** Reading (Hebel). **3.0,** Variety Concert. Part I: Gramophone Music. Part II: Concert by the Station Chamber Choir, conducted by Josef Breuer. Soloists: Mariga Bäumt (Guitar) and Egbert Grape and Hans Haas (Pianoforte). **5.0 to 5.35,** See **Frankfurt. 5.35,** Fiddle Solos. **5.50,** Announcements. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** See **Frankfurt. 7.10,** Concert, relayed from **Emmerich.** Part I: Künneke Music by the Station Orchestra, conducted by the Composer. Overture, The Ace of Hearts; Dance Suite. Part II: Gramophone Music. Part III: Musik by the Station Orchestra, conducted by Kühn. Soloist: Kläre Hansen (Soprano). Viennese Waltz (Wagenaar); Songs for Soprano and Orchestra (R. Strauss): (a) Das Rosenband, (b) Ständchen; Waltz from Der Rosenkavalier (R. Strauss); Polonaise in E (Liszt); Perpetuum mobile (Joh. Strauss); Radetzky March (Joh. Strauss). **9.0,** See **Frankfurt. 9.20,** See **Stuttgart. 9.30,** News and Weather. **9.45,** Light Music on Gramophone Records. **10.0,** Report on the Six Days' Racing. **10.15,** Bunter Abend. A Dance Band and the Fröhliche Fünf, Conductor: Curt Baumgarten. **11.0,** Serenade on Gramophone Records. **1.0 a.m. (Sunday),** Close Down.

LAUSANNE.—See **Radio-Suisse Romande.**

LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by **Dresden, 941 kc/s, 319 metres.**—**12.30** (from **Dresden**), Concert by Pepi Stoss and his Viennese Schrammel Trio. March, Grüss Gott Wien (Kerker); Waltz, Süsse Mädel (Reinhardt); Amatische Zauberer Siede); Johann Strauss Waltz Potpourri (Weinstabl); Selection from The Bird Fancier (Zeller); Song, Ich war zu Heidelberg

Student (Lob); Waltz, Fideles Wien (Komzák); Ferdl-Marsch (Wächter). **1.15,** News. **1.30,** Programme for Children. **2.10,** Agricultural Notes. **2.25,** Talk on Economics. **2.40,** Economic Notes and Weather. **3.0,** Concert Relay. **4.30,** Review of Periodicals. **4.50,** Reading (Ferdinand Thürmer). **5.20,** A Modern Dictionary. **5.45,** To-day's News. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** See **Breslau. 9.0,** News. **10.0,** See **Munich. 11.0** (approx.), Close Down.

LINZ.—See **Vienna.**

LJUBLJANA

522 kc/s, 574.7 metres. 7 kW.—**6.0 p.m.,** Talk on Philosophy. **6.30,** Talk: Foreign Affairs. **7.0,** Orchestral Concert. **8.0,** Vocal Quartets. **8.30,** Weather and News. **8.50,** Dance Music.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—French Evening. **7.0 p.m.,** The Fantastic Symphony (Berlioz), on Gramophone Records. **7.30,** Trio No. 2 (Beethoven), by René Delporte (Pianoforte), Ernst Eichel (Violin), and Leon van Eckhout (Cello). **7.55,** Cinema Review. **8.5,** Concert of French Music by the Station Orchestra, conducted by Henri Pensis. Overture, Mignon (Thomas); Clair de lune (Koecklin); Suite of Dances (Pierné). **8.30,** Review of Economics. **8.35,** Concert (contd.). Ballet Suite, La Source (Delibes). **8.50,** News in French. **9.0,** Radio Luxembourg Musical Medley—International Concert by the Station Orchestra, conducted by Henri Pensis, and Soloists. **9.50,** News in German. **10.0,** Gramophone Concert. Overture, Mirella (Gounod); Selection from Il Trovatore (Verdi); Selection from Samson and Delilah (Saint-Saëns); Selection from Louise (Charpentier); Selection from Gipsy Love (Lehár); Selection from The Geisha (Jones); Selection from Grande Reine (Gensler); Selection from Tip Toes (Gershwin); Selection from Sunny (Kern). **10.50,** Dance Music.

LWOW

788 kc/s, 381 metres; 16 kW.—**6.0 p.m.,** History Talk. **6.12,** Announcements. **6.25,** See **Warsaw. 6.55,** Programme Announcements. **7.0,** See **Warsaw. 9.15,** Concert of Light Music by a Mandoline Orchestra. **10.0,** See **Warsaw. 11.0** (approx.), Close Down.

LYONS

LA DOUA, 644 kc/s, 465.8 metres; 3 kW.—**7.30 p.m.,** Radio Gazette for Lyons and the South East. **8.30,** Operetta Music, relayed from **Paris (Ecole Supérieure), 671 kc/s, 447.1 metres.** After the Relay: News Bulletin.

MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—**6.0 to 8.0 p.m.,** Programme for Listeners in the Canary Islands, Guinea and Europe. **6.0,** Popular Concert. **7.15,** Talk. **7.30,** Light Music. **8.0 to 10.30,** Interval. **10.30,** Concert of Popular Music. **10.45,** Radio Chronicle. **11.0,** Concert Versions of La Generala—Musical Comedy (Vives), and Jotas aragonesas (Navarro). **11.45,** Light Music. **12 Midnight** till Close Down, I.B.C. Concert of Dance Music: Say it with Music (Moll); Mama Inez (Grenet); They didn't believe me (Kern); Love's Old Sweet Song (Molloy); Oh, Johanna (Lawrence); It's the Talk of the Town (Symes); The Wedding of Mr. Mickey Mouse (Pola); The Last Round up (Hill). **12.30 a.m. (Sunday),** I.B.C. Goodnight Melody and Close Down.

MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—**7.0 p.m.,** Chimes Exchange. Topical Talk, Talk, Dance Music and Talk on Hygiene. **8.15,** Radio Journal. **8.30 to 9.15,** Interval. **9.15,** English Lesson. **9.30,** Chimes, Time and Radio Journal. **9.45** (approx.), Music Competition: Part I—Violin Recital by Luis Anton; The Devil's Sonata (Tartini-Kreisler); First Movement of the Concerto No. 2 (Vieuxtemps); Spanish Suite (Nin-Kochansky); Divertissement (Pittaluga); Songs without Words (Hierro); Part II: Song Recital by Consuelo Obregon: Romance, Katiuska (Sorazábal); Variations (Proch); Madrigal (Villar); Allegro from La Sonnambula (Bellini); Song (Aulo Aria from Rigoletto (Verdi); Hindu Song (Rimsky-Korsakov); Romance, Marina (Arrieta). **11.45,** Radio Journal. **12 Midnight,** Chimes and Close Down.

MALMO. See **Stockholm.**

MILAN.—See **Turin.**

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—**5.25 p.m.,** Concert of Russian Music by a Balalaika Orchestra, conducted by Ivan Cymljansky. **6.0,** See **Prague. 6.25,** Concert by the Station Orchestra, conducted by Musil: Overture, Isabella (Suppé); Waltz from The Bonbon King (Provanznik); Selection from The Land of Smiles (Lehar); Elegy and Krakowiak from Polenblut (Nedbal); Polka (Moor); Spanish Dance (Kinel). **7.15,** See **Prague. 7.40,** See **Bratislava. 9.0,** See **Prague. 10.30** (approx.), Close Down.

MOSCOW

KOMINTERN, 202.5 kc/s, 1,481 metres; 50 kW.—**3.30 p.m.,** Educational Programme. **4.30,** Red Army Programme. **5.30,** Programme for Collective Farm Workers. **6.30,** Talk: The Röntgea Rays. **7.0,** Concert. **8.0,** Programme in German. **8.55,** Chimes from the Red Square. **9.5,** Programme in French. **10.5,** Programme in Spanish.

MOTALA.—See **Stockholm.**

MUHLACKER.—See **Stuttgart.**

MUNICH

563 kc/s, 533 metres; 1.5 kW. Relayed by **Augsburg** and **Kaiserslautern, 536 kc/s, 560 metres;** and **Nürnberg, 1,256 kc/s, 239 metres.**—**3.30 p.m.,** Concert by the Small Station Orchestra, conducted by Karl List: Overture, Die Fledermaus (Joh. Strauss); The Skaters' Waltz (Waldteufel); Romantic Suite, Walpurgisnacht (Lüling); Serenade (Widor); Berceuse (Godard); Scherzo (d'Albert); Potpourri, From the Rhine to the Danube (Rhoda); March, Waidmanns Heil (Reckling). **4.45,** Programme for Young People. **5.15,** String Quartet (Pottgiesser), by the Stuhlfauth String Quartet. **5.45,** Wireless Notes. **6.0,** Transmission for all German Stations, relayed from **Hamburg. 7.0,** See **Breslau. 9.0,** Time and News. **10.0,** Serenade. **11.0** (approx.), Close Down.

NAPLES.—See **Rome.**

NOTODDEN.—See **Oslo.**

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by **Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.1 metres;** and **Rjukan, 671 kc/s, 447.1 metres;** and **Jelöy LCL, 6,990 kc/s, 42.92 metres.**—**3.30 p.m.,** Gramophone Concert. **4.15,** Programme for Children. **5.15,** Norwegian Music by a Hardanger Fiddle Trio. **5.45,** Talk on Economics. **6.0,** Announcements, Weather and News. **6.30,** Talk. **7.0,** Time Signal. **7.1,** Popular Concert by the Station Orchestra and Soloists. **8.40,** Weather and News. **9.0,** Topical Talk. **9.15,** Songs to the Ukelele and Hawaiian Guitar, by Gerd and Otto Nielsen, relayed from **Tröndelag. 9.45,** Gramophone Music. **11.0** (approx.), Close Down.

OSTERSUND.—See **Stockholm.**

PALERMO

556 kc/s, 539.5 metres; 3 kW.—**7.0 p.m.,** Dopolavoro Announcements, Tourist Talk, Agricultural Notes and Giornale Radio. **7.20,** Gramophone Music. In the interval at **7.25,** Sports Notes, Time and Announcements. **7.45,** Casa mia, casa mia—Operetta in Three Acts (Pietri). In the interval, Book Review and Announcements. **10.0,** Giornale Radio.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on **2,650 metres**) at **9.26 a.m.** and **10.26 p.m.** (Preliminary and 6-dot Signals).—**5.45 p.m.,** Le Journal Parlé. **7.15,** Weather. **7.25,** News. **7.30,** Les châteaux en Espagne (Castles in Spain)—Comedy in Five Acts (d'Harleville). **9.0** (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—**7.0 p.m.,** Humorous Scenes on Gramophone Records. **7.15,** Le Journal Parlé. **7.30,** Waltz Music on Gramophone Records: Grande valse brillante (Chopin); Valse lente in A minor (Chopin); Valse, Op. 64, No. 2 (Chopin); Song Waltz (Vogel); The Blue Danube (Joh. Strauss). **7.50,** Talk: The Event of the Week. **8.0,** Theatre Review. **8.10,** Interval. **8.30,** Sponsored Programme. **9.0,** Interval. **9.20,** Jazz Music and Dance Music, conducted by Lucien Moraweck. **11.30,** News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—**6.45 a.m.,** Physical Culture. **7.30,** Weather and Physical Culture. **7.45,** Gramophone Music. **8.0,** Press Review and Weather. **9.30,** Concert arranged by the Société des Concerts, relayed from the Conservatoire. **12 Noon,** Gramophone Concert, Cordoba (Lozano-Salabert); Tyrolienne (Blangy); Fleur fanée (Legendre); In a Clock Store (Orth); Melody (Lindsay-Theimer); Santica (Guida); S'aimer (Gabaroche); Ah! le beau rêve (Gauwin-Daris); Fête militaire (Sulvain); Petillante (Marceau); Stances (Flégier); Un tango langoureux (Matco-Decker); La Rose rouge, from Monsieur Beaucaire (Messager); Petite Suite de Concert (Coleridge-Taylor); Des mots d'amour (Gromon); Selection from Madame Pompadour (Fall); March (Rhode); Le Carton de Wiart (Noury); Serenade, Il Bacio

DEC. 2nd **SATURDAY** *continued*

(Micheli); Singing in the Rain (Nacio-Herb-Brown); Amina (Lincke); Magic Lantern (Godard); The Mill in the Black Forest (Eilenberg); Miroir du Desert (Magritte-Pares); Delilah (Nicholls); Selection from Le Prince Charmant (Parès-Van Parys); Manola (Liberad); Chéri (Monte-Wilhite); Melody (Mahieux-Craven); The Wedding of the Painted Doll (Nacio-Herb-Brown); A l'américaine (Marceau). In the interval at **1.0**, Exchange, News and Weather, and at **1.30**, Exchange. **2.0**, Relay of the Addresses from the Académie des Beaux-Arts. **3.0**, Programme for Children. **3.45**, Exchange and Market Prices. **6.20**, Agricultural Report. **6.45**, Gramophone Music. **7.0**, Talk: Forgotten Inventors. **7.20**, Gramophone Music. Ma Rosine (Nelly Laurent-Halet); Eternel Printemps (Popy); The Song of the Vagabond (Richmann); Joujou (Fyscher); J'ai deux amours (Scotto); Adoration (Philippon); Je connais une blonde (Goety-Sloane); Bandeon (Maffia y Spiana). **7.45**, Review of the Latin Press. **8.0**, Song Recital. In the intervals: News, Weather, Sports Notes, Review by Jean Rieux, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed on **W8XK** on **48.46 metres** and **25.27 metres.—6.45 to 10.30 p.m., New York** Relay. **6.45**, Football Game. **9.30**, Dance Masters. **10.0**, Casino Orchestra. **10.30**, A Recreo—Bill and Alex. **10.45**, Orphan Annie, from **New York**. **11.0**, News, Pat Haley. **11.15**, Sports and Programme Preview. **11.30**, Evensong. **11.45**, Programme to be announced. **12 Midnight**, Happy Felton's Orchestra. **12.30 to 3.0 a.m. (Sunday), New York** Relay. **12.30**, Trio Romantique. **12.45**, O'Leary's Irish Minstrels. **1.0**, Waldorf Orchestra. **1.30**, Sous les Ponts de Paris. **2.0**, Jamboree. **3.0**, Behind the Law.

PORSGRUND.—See **Oslo.**

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—**3.0 p.m.**, Concert of Light Music by Dvorsky and his Melody Boys. **3.50**, Educational Talk for Young People. **4.15**, Talk on Commerce. **4.25**, Gramophone Records. **4.35**, Czech Lesson for German Listeners. **4.50**, Gramophone Records. **5.5**, Agricultural Talk. **5.15**, Talk for Workers. **5.25**, News in German. **5.30**, German Transmission: Musical Programme. **6.0**, Time, News and Weather. **6.10**, Talk. **6.25**, See **Brno.** **7.15**, Recital of Contemporary Music for Two Pianofortes, by Ervin Schulhoff and Letfus: Sonata Op. 41 (Vojácek); Two Divertissements (Zelinka). **7.40**, See **Bratislava.** **9.0**, Time, News, Review of the Day and Sports Notes. **9.15**, Dance Music by a Brass Band, a Vocal Quartet and Accordionists (Duets); March (Sykora); Waltz (Behlik); Polka (Pehel); Tango (Tichy); March (Balling); Waltz (Kricka); Polka (Labsky); Tango (Voldan); Potpourri (Bernhard); Waltz (Poncar); Polka (Czrny); (Balling); March (Biskup). **10.30** (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW; and **Geneva, 400 kc/s, 749.9 metres.—6.0 to 6.15 a.m.** (from **Lausanne**), Gymnastics. **11.28**, Time Signal from Neuchâtel Observatory. **11.30**, News, Weather and Sports Notes. **11.40** (from **Geneva**), Gramophone Music. **12 Noon** (from **Geneva**), Financial News. **12.10 p.m.** (from **Geneva**), Gramophone Concert. **1.0 to 2.58**, Interval. **2.58**, Time Signal from Neuchâtel Observatory. **3.0** (from **Lausanne**), Concert by the Small Radio Lausanne Orchestra, conducted by Moser. **3.45**, Concert relayed from **Lugano.** **5.0** (from **Geneva**), Programme for Children. **5.20** (from **Geneva**), Talk for Young People: Notable Swiss Men. **5.40** (from **Geneva**), Film Review. **6.5** (from **Geneva**), Talk: Insurance against Accidents at Work. **6.30** (from **Geneva**), Weather and Announcements. **7.0** (from **Geneva**), Dance Rhythms. **7.10** (from **Geneva**), Variety Items by Ruy Blag. **7.25**, Introductory Talk to the Following Transmission. **7.35**, Concert by the Radio-Suisse Romande Orchestra, conducted by Ernest Ansermet. Soloist: Fernhand Pollain ('Cello): Extracts from Manfred (Schumann); 'Cello Concerto (Haydn); Rhapsody for Clarinet and Orchestra (Debussy); Suite for 'Cello and Orchestra, Pollainiana (Strong): Overture, The Mastersingers (Wagner). **8.30** (approx.), News and Weather. **9.0** (approx.), Talk: The Work of the League of Nations. **9.30** (from **Geneva**), Dance Music on Gramophone Records. **10.30** (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—**8.10 p.m.**, Weather. **8.20**, Musical Programme and Announcements. **8.35**, Programme to be announced. **9.0**, Chimes. **9.2**, Concert by the Radio Trio. **9.30**, Reading. **10.0**, News. **10.30**, Choral Music on Gramophone Records, followed by Dance Music. **1.0 a.m. (Sunday)**, Close Down.

RIGA

571 kc/s, 525.3 metres; 15 kW.—**6.5 p.m.**, Concert of Marches and Dances from Opera, conducted by Parups: Polonaise and Waltz from Eugene Onegin (Tchaikovsky); Gavotte from Mignon (Thomas); Rigaudon from Dardanus (Rameau); Waltz from Faust (Gounod); Ballet Music from Lakmé (Delibes); Persian Dances from Khovanstchina (Mussorgsky); Gopak from The Fair at Sorochinsk (Mussorgsky); March from Prince Igor (Borodin); March from Lohengrin (Wagner); Dance of the Shadows from Dinorah (Meyerbeer); March of the Toreadors from Carmen (Bizet); Waltz from Der Rosenkavalier (R. Strauss); March from Tannhäuser (Wagner). In the interval at **7.0**, News. **8.0**, Weather and News. **8.15**, Choral Concert. **9.0**, Dance Music. **10.0** (approx.), Close Down.

RJUKAN.—See **Oslo.**

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 652 kc/s, 453.1 metres,** from **7.45 p.m.**; and **2RO, 11,810 kc/s, 25.4 metres.—12 Noon to 1.15 p.m.**, Orchestral Concert: Per te sarò tenents (Brancucci); Prelude to and Minuet from L'Arlésienne (Bizet); Anna capricciosa (Sarpny); Serenata (Culotta); Selection from La Bohème (Puccini); El Caballero (Rossi); Rumanian Rhapsody (Knumann); Bella Lolita (d'Anzi). In the intervals from **12.30 to 12.45**, Giornale Radio, and at **1.0**, Time and Announcements. **3.30**, Children's Radio Review. **3.55**, Giornale Radio and Report of the Royal Geographical Society. **4.10**, Weather. **4.15 to 5.0**, Orchestral Concert: Selection from White Horse Inn (Stolz-Benatzky); Sinfonietta veneziana (Principe); Waltz (Escobar); Soleyma (Chesi); Selection from Andrea Chénier (Giordano); Giardino chiuso (Amadei); Only a night (Roland). **5.40 (Naples),** Shipping and Sports Notes. **5.45**, Lesson in Morse and Dopolavoro Report. **6.0**, Tourist Report. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Giornale Radio. **7.0**, Time and Announcements. **7.15**, Gramophone Music. **7.30**, Giornale Radio and Sports Notes. **7.45**, Concert, conducted by Andrea Marchesini. In the intervals, Talk and Scientific Review. **10.0**, Giornale Radio.

SALZBURG.—See **Vienna.**

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on **31.48 metres** and by **W2XAD** on **19.56 metres.—12.45 a.m. (Sunday),** Stock Reports. **1.0**, Popular Programme. **1.30**, Antobals Cubans, from **New York.** **1.45**, Club Programme. **2.0 to 4.0, New York** Relay. **2.0**, Popular Programme. **2.30**, Variety Programme. **3.0**, Saturday Dancing Party. **4.0**, Programme Résumé.

SCHWEIZERISCHER LANDESSENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; **Basle, 1,229 kc/s, 244.1 metres;** and **Berne, 1,220 kc/s, 245.9 metres.—5.50 a.m. to 6.5 (from Berne),** Gymnastics. **11.0** (from **Berne**), Gramophone Music. **11.29**, Time Signal from Neuchâtel Observatory, followed by Weather and News. **11.40** (from **Berne**), Review of the Week's Events in the Federal Parliament. **11.50** (from **Berne**), Light Music on Gramophone Records. **12.15 p.m.** (from **Berne**), Song Recital. **12.25** (from **Berne**), Time, Weather and Exchange. **12.30** (from **Berne**), The Listener's Quarter-of-an-Hour. **12.45** (from **Berne**). Book Review. **1.15** (from **Berne**), Gramophone Music. **1.30** (from **Berne**). Talk: The Motor Car on the Alpine Roads in Winter. **2.0**, Interval. **3.0** (from **Berne**), Concert by the Frohsinn Hand-Harp Club. **3.30** (from **Berne**), Thirty Years Ago—Radio Sequence from Old Newspapers (Franziskus). **3.45**, Programme relayed from **Lugano.** **5.0** (from **Basle**), Marches on Gramophone Records. **5.30** (from **Basle**), Programme for Young People. **6.0**, Chimes from the Zürich Churches. **6.15** (from **Basle**), Time, Weather and Exchange. **6.20** (from **Basle**), Opera and Operetta Music (on Gramophone Records). **7.0** (from **Basle**), Dutch Programme. In the interval at **8.0** (approx.), Weather and News. **9.15** (from **Basle**), Dance Music on Gramophone Records. **10.0** (approx.), Close Down.

SOTTENS.—See **Radio-Suisse Romande.**

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden, 242 kc/s, 1,239.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,167 kc/s, 257 metres; Motala, 222 kc/s, 1,348 metres; Ostersund, 402 kc/s, 746.2 metres;** and **Sundsvall, 554 kc/s, 542 metres.—3.0 p.m.**, Technical Talk. **3.20**, Light Orchestral Music: Selection from New Moon (Romberg); Erotikon No. 2 (Sjögren); Minuet (Petre); Serenata alla Luna (De Micheli); I Live for love from Ball at the Savoy (Abraham); Foxtrot from A Midnight Tango (Komzak). **4.5**, Programme for Children, relayed from **Orebro, 1,265 kc/s, 237.2 metres. 4.30**, Song Recital by Thelma Winge. **4.45**, Gramophone Music. **5.45**, Talk on Spain. **6.15**, Weather and News. **6.30** (from **Göteborg**), Old Dance Music. **7.0**, Military Band Concert, conducted by Grundström: Overture, Der Freischütz (Weber); Ballet Music from The Prophet (Meyerbeer); Ständchen (Schubert); Extracts from Don Carlos (Verdi); 1812 Overture (Tchaikovsky). **8.0**, Cabaret Programme. **8.45**, Weather and News. **9.0**, Dance Music. **10.0** (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—**11.30 a.m.**, Gramophone Concert. **12.45 p.m.**, News. **1.0**, Time. **1.1**, Variety Concert, conducted by Roskam. **2.0**, Legal Talk in German. **2.15**, Gramophone Concert. **3.0**, Talk on Music: The End of the Impressionist Movement. **3.15**, Interval. **4.0**, Dance Music on Gramophone Records. **5.0**, Symphony Concert by the Pasdeloup Concert Society, relayed from the Théâtre des Champs Elysées, Paris. **7.0**, French Lesson. **7.15**, Talk: The Treatment of Fruit Trees in Winter. **7.30**, Time and News. **7.45**, Gramophone Records. **8.0**, Press Review in German, Lottery Results and Announcements. **8.30**, Un Soir de Réveillon—Radio Film (after an Operetta by Abraham). **10.30** (approx.), News, followed by Dance Music, relayed from the Savoy. **12 Midnight**, Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 1.5 kW. Relayed by **Freiburg, 527 kc/s, 570 metres.—12.15 p.m.**, See **Frankfurt. 12.25**, Local News. **12.35**, Gramophone Concert. **1.30**, Programme for Young People. **2.30**, Concert by the Stuttgart Mandoline Orchestra, conducted by Leo Hantz: Landknechtsmarsch; Julia Serenata (Francheschi); Gondellied (Hantz); Stolzenfels am Rhein (Meissler): March, Mein Regiment (Blankenberg); Veilchen aus Abbazzia (Wenzel); Die Jugend marschiert (Lindemann). **3.0**, See **Langenberg. 5.0 to 5.35**, See **Frankfurt. 5.35**, Talk: Southern Germany in Prehistoric Times. **5.50**, Time and Announcements. **6.0**, Transmission for all German Stations, relayed from **Hamburg. 7.0 to 9.20**, See **Frankfurt. 9.20**, Talk: Things you should know. . . . **9.30**, Local News. **9.45 to 12.15 a.m. (Sunday)**, See **Langenberg. 12.15**, Die Sieben Schwaben—Radio Sequence of Swabian Songs, Dances and Anecdotes (arr. Martin Lang and Gustav Görlich), by a Double Quartet, a Peasant's Orchestra and Soloists. **1.15** (approx.), Close Down.

SUNDSVALL.—See **Stockholm.**

TOULOUSE

779 kc/s, 385 metres; 8 kW.—**6.0 p.m.**, News. **6.15**, Orchestral Music. **6.30**, Operetta Music: Arias fom La vie parisienne (Offenbach); Marietta (O. Straus); Azor (Gabaroche); and Marius à Paris (Malhieux). **6.45**, Music by an Argentine Band. **7.0**, Songs. **7.15**, News and Exchange. **7.30**, Overture, William Tell (Rossini), by the Station Orchestra. **7.45**, Opera Music: Arias from Louise (Charpentier); Sappho (Massenet); Manon (Massenet); and Don Quixote (Massenet). **8.0**, Orchestral Music: Potpourri of Classical Music; Selection from Mam'zelle Nitouche (Hervé); Selection from Le pays du soleil (Scotto). **8.15**, Chansonnettes. **8.30**, Accordion Solos. **8.45**, Military Band Music. **9.0**, Concert Version of La mascotte—Operetta (Audran). **9.30** (approx.), Orchestral Concert: Three Pieces (Satie); Berceuse from The Fire Bird (Stravinsky); Entry March of the Gladiators (Fucik); Toréador et Andalouse (Rubinstein); Heinzelmännchens Wachtparade (Noack); Overture, Raymond (Thomas). **10.0**, Russian Songs and Balalaika Music. **10.15**, News. **10.30**, Music by an Argentine Band, followed by Music from Sound Films. **11.0**, Request Music. **11.15**, Dance Music. **12 Midnight**, News, Weather, and Announcements. **12.5 a.m. (Sunday)**, Light Music by a Viennese Orchestra: Potpourri, Around the Volga (Borchart); Hungarian Potpourri; Waltz Potpourri (Hildebrandt); Wiener Kinder (Strauss). **12.30** (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—**4.10 p.m.** till Close Down, See **Turin.**

TRONDHEIM.—See **Oslo.**

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan, 903 kc/s, 332.2 metres; Genoa, 959 kc/s, 312.8 metres;** and **Florence, 598 kc/s, 501.6 metres.—4.10 p.m.**, Gramophone Music. **5.0 to 5.5**, Weather. **5.40**, Giornale Radio. Announcements and Gramophone Music. **6.0**, Time, Tourist Report and Gramophone Music. **6.10**, Wheat Market Report. **6.20**, News in Foreign Languages. **6.40**, Gramophone Music. **7.0**, Giornale Radio and Weather. **7.25**, Talk: Events and Problems. **7.40**, Variety Programme. **8.45**, Review of New Books. **9.0**, Dance Music. **10.0**, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and **5,969 kc/s, 50.26 metres (Evening);** 10 kW.—**10.0 to 10.15 a.m.**, Religious Information in Various Languages. **7.0 to 7.15 p.m.**, Religious Information in Italian.

VIENNA

580 kc/s, 517.2 metres; 100 kW. Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.1 metres; Linz, 1,220 kc/s, 245.9 metres;** and **Salzburg, 1,373 kc/s, 218.5 metres;—11.0 a.m.**, Orchestral Concert, conducted by Otto Wacek. In the interval at **12 Noon,** Time and News. **1.0**, Interval. **2.0**, Time, Weather and Exchange. **2.15**, Italian Conversation. **2.40**, Mandoline Concert: Selection from Il Trovatore (Verdi); Polka, Frauenherz (Joh. Strauss); Waltz, Violetta di Parma (Becucci); Intermezzo, Yola (Johnson); Leuchtkäferchens Stelldichein (Siede); Spanish Dance (Metras). **3.20**, Talk. **3.45**, Talk: The Swamps and Steppes in Winter. **4.10**, Orchestral Concert, conducted by Julius Herrmann: Starhemberg-Marsch (Ritzberger); Overture, Light Cavalry (Suppé); Waltz from Eva (Lehar); Selection from The Gipsy Princess (Kalman); Die Dorfmusik (Fryberg); Song Potpourri Servus Wien (Dostal); Waltz, Badner Madln (Komzak); March, Tiroler Adler (Achleithner). **5.15**, Topical Programme. **5.45**, Recital of Folk Songs by the German Folk Song Society of Vienna, Lina Gröschl (Soprano) and Elsa Richar (Pianoforte); Introductory Talk by Dr. Karl Kotek. **6.45**, Time, Weather, Sports Report and Programme Anouncements. **6.55**, To-day's Motto. **7.0**, Concert in Aid of the Vienna Winter Relief Fund, relayed from the Musikvereinssaal. In the interval, News. After the Programme, Gramophone Concert and Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—**10.57 a.m.**, Time Signal and Fanfare from St. Mary's Church, Cracow. **11.5**, Classical Music on Gramophone Records. **11.30**, Radio Journal. **11.35**, Weather. **11.38**, Gramophone Music (contd.). **12 Noon,** Interval. **2.25**, News and Economic Notes. **2.40**, Shooting Notes. **2.55**, Aviation Notes and Anti-Gas Report. **3.0**, Song Recital by Cécile Wegrzynowska. **3.20**, Programme for Invalids, relayed from **Lwów, 788 kc/s, 381 metres.—3.40**, French Lesson. **4.0**, Divine Service, relayed from **Wilno, 530 kc/s, 566 metres. 5.0**, Reading. **5.20**, Baritone and Violin Recital by Zelechowsky and Tawroszewicz: Arias from (a) A Masked Ball (Verdi), (b) Nero (Rubinstein); Song, The Prisoner (Gretchaninov); Violin Solo: Rondo capriccioso (Saint-Saëns); Baritone Solos: (a) La coupe de ma vie (E. Walter), (b) March (Tosti), (c) Torna amore (Buzzi-Peccia); Violin Solos: (a) Humoresque (Tchaikovsky-Kreisler), (b) Berceuse (Stravinsky), (c) Serenade (Chaminade), (d) Tarantella (Wieniawsky). **6.0**, Programme Announcements. **6.5**, Miscellaneous Items. **6.25**, Reading from the Works of Marshal Pilsudski. **6.40**, Sports Notes. **6.47**, Radio Journal. **6.55**, Interval. **7.0**, Concert by the Station Orchestra, conducted by Nawrot. Soloist: Witas (Tenor). Selection from La Princesse de Trézihonde (Offenbach); Three Tenor Solos from Les cloches de Corneville (Planquette); Serenade (Schoeck); Songs; Waltz, Danube Pearls (Vollstedt); Krakoviak (Sygietynski); Mazurka (Wronski). **8.0**, Answers to Correspondents. **8.20**, Chopin Pianoforte Recital by Marguerite Trombini-Kazuro; Polonaise in C Minor, Op. 40; Scherzo in B Flat Minor, Op. 31; Etude in A Flat, Op. 25; No. 1 Etude in A Flat; Fantasia in F Minor, Op. 49; Mazurka in F Minor; Waltz in A Flat, Op. 34. **9.0**, Talk in French: Work in Poland. **9.15**, Dance Music on Gramophone Records. **10.0**, News. **10.5**, Dance Music, relayed from the Café Gastronomia.

WILNO

530 kc/s, 566 metres; 16 kW.—**6.20 p.m.**, Miscellaneous Items. **6.25**, See **Warsaw. 6.45**, Announcements. **6.47**, See **Warsaw. 7.0**, Programme for the 10th Anniversary of the Foundation of the Wilno Conservatoire, relayed from the Conservatoire: Addresses; Overture, Bajka (Moniuszko); Songs; Pianoforte Concerto (Rozycki). **8.0**, Request Gramophone Records. **9.8**, Educational Talk. **9.15**, See **Warsaw. 11.0** (approx.), Close Down.

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—**4.0 p.m.**, Concert by the Simacek-Sever-Kern Trio. **5.30 to 6.5**, Interval. **6.5**, Talk. **6.35**, Sports Notes. **6.45**, Announcements. **7.15**, Orchestral Concert; Soloist, Margita Bornstein (Soprano). **8.15**, Concert of Light Music by the Radio Orchestra. **8.45**, Dance Music. **9.0**, News, Weather, and Programme Announcements. **9.15**, Dance Music. **10.0** (approx.), Close Down.

ZURICH.—See **Schweizerischer Landessender.**

PRINCIPAL BROADCASTING STATIONS OF EUROPE

Arranged in Order of Wavelength

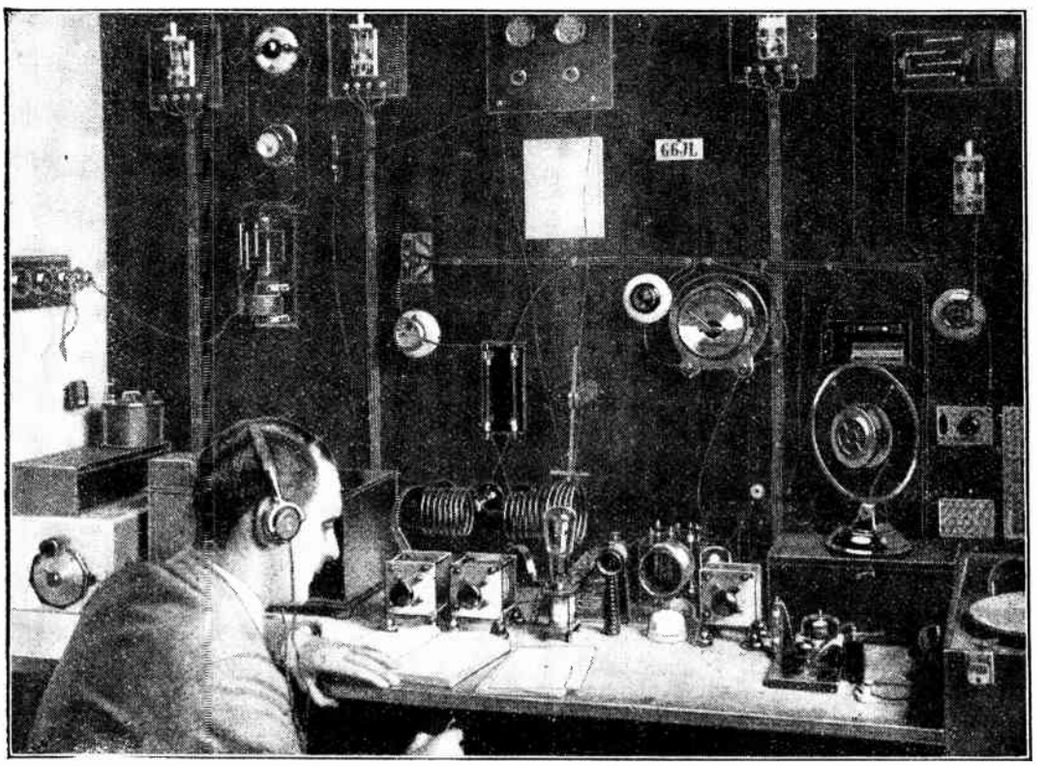
Metres.	kc/s.	kW.	Station.	Tuning Positions.
1935	155	7	Kaunas (Kovno) (Lithuania)	
1875	160	8.5	Huizen (Holland) (*Kootwyk*, 50kW., *after 3.40 p.m.*) (*K.R.O. and N.C.R.V. programmes.*)	
1796	167	50	Lahti (Finland)	
1725	174	75	Radio Paris, CFR	
1635	183.5	60	Berlin (Deutschlandsender) (Germany). (*S.-W. Stn. DJA on 31.38 m., DJB on 19.73 m., DJC on 49.83 m., DJD on 25.51 m., DJE on 16.86 m.*)	
1554.4	193	30	Daventry National	
1546	194	7	Ankara (Angora) (Turkey)	
1481	202.5	500	Moscow, RV1 (Russia) (*S.-W. Stn. on 25m.*)	
1446	207.5	13	Eiffel Tower, FL, Paris	
1412	212.5	120	Warsaw I (Poland)	
1380	217.5	100	Novosibirsk, RV76 I (Russia)	
1348	222.5	30	Motala (Sweden). (*Relays Stockholm*)	
1304	230	100	Moscow, WZSPS (Trade Union) (Russia)	
1200	250	5	Stamboul (Turkey)	
1200	250	21	Reykjavik (Iceland)	
1190	252	200	Luxembourg	
1170	256	25	Tashkent, RV11 (Russia)	
1154	260	30	Kalundborg (Denmark). (*Relays Copenhagen*)	
1154	260	20	Monte Ceneri (Switzerland).	
1117	268.5	40	Moscow, Popoff RV58 (Russia)	
1083	277	60	Oslo (Norway)	
1071	280	35	Tiflis, RV7 (Russia)	
1035	290	36	Kiev, RV9 (Russia)	
1000	300	100	Moscow RV49 (Russia). (*S.-W. Stn. on 50 m.*)	
938	320	20	Kharhov, RV4 (Russia)	
857	350	100	Leningrad (Russia)	
840	357	18.5	Budapest (Hungary)	
800	375	50	Sverdlovsk, RV5 (Russia)	
750	400	1.3	Geneva (Switzerland). (*Relays Sottens*)	
720	416.6	20	Moscow, RV2 (Experimental) (Russia)	
689	436	1.5	Oulu (Uleaborg) (Finland)	
574.7	522	0.7	Hamar (Norway) (*Relays Oslo*)	
574.7	522	7	Ljubljana (Yugoslavia)	
570	527	0.25	Freiburg (*Relays Muhlacker*)	
568.1	528	2	Grenoble (France)	
565	531	16	Wilno (Poland). (*Relay Station*)	
560	536	1.5	Kaiserslauten and Augsburg (*Relay Munich*)	
550	545	18.5	Budapest No. 1 Lakihegy (Hungary)	
542	554	10	Sundsvall (Sweden). (*Relays Stockholm*)	
539.6	556	3	Palermo (Italy)	
533	563	60	Munich (Germany)	
525	571	15	Riga (Latvia)	
517.2	580	100	Vienna (Bisamberg) (Austria)	
509	589	15	Brussels No. 1, Velthem (Belgium). (*In French*)	
501.6	598	20	Florence, 1FI (Italy) (*Relays Turin*)	
495.8	605	1.2	Tröndelag (Norway)	
488.6	614	120	Prague (Czechoslovakia)	
480	625	50	North Regional (Manchester)	
472.4	635	60	Langenberg (Germany)	
465.8	644	1.5	Lyons la Doua, PTT (France)	
459.4	653	60	Beromünster (Schweizerischer Landessender) (Switzerland).	
453.2	662		San Sebastian, EAJ8 (0.6 kW.); Klagenfurt (0.5 kW.) (Austria) (*relays Vienna*).	
453.2	662	0.25	Agen (France)	
453.2	662	4	Milan (Vigentino) (Italy). (*Relays Rome*)	
451.8	664	20	Madona (Latvia). (*Relays Riga*)	
447.1	671	0.5	Danzig (*Relays Heilsberg*)	
447.1	671	7	Paris, Ecole Supérieure, PTT	
441.2	680	50	Rome, IRO. (*S.-W. Station, 2RO on 25.4 m.*)	
435.4	689	55	Stockholm, SASA (Sweden)	
429.7	698	2.5	Belgrade (Yugoslavia)	
424.3	707	2	Madrid, EAJ7 (Union Radio)	
424.3	707	100	Moscow, Imini Stalina (Russia)	
419.5	715	1.5	Berlin, Funkstunde (Germany)	
416.4	720.5	5	Rabat (Morocco)	
413	725	60	Athlone (Irish Free State)	
408.7	734	16	Katowitz (Poland)	
403.8	743	25	Sottens (Radio Suisse Romande) (*Switzerland*)	
398.9	752	25	Midland Regional (Daventry)	
394.2	761	12	Bucharest (Roumania)	
389.6	770	120	Leipzig (Germany)	
385.1	779	8	Toulouse (Radiophonic du Midi) (France)	
385.1	779	10	Stalino, RV26 (Russia)	
381	788	16	Lwow (Lemburg) (Poland)	
376.4	797	50	Scottish Regional (Falkirk)	
372.2	806	1.5	Hamburg (Germany)	
366.7	818	0.8	Radio, LL, Paris	
368.1	815		Seville, EAJ5 (Union Radio) (1.0 kW.); Galicia EAJ4 (0.2 kW.) (Spain); Bolzano (1.0 kW.) (Italy); Helsinki (10 kW.) (Finland) (*relays Lahti*); Kharkov, RV20 (10kW) (Russia).	
368.1	815	0.7	Fredriksstad (Norway). (*Relays Oslo*)	
364.1	824	1	Bergen (Norway)	
363.6	825	13	Algiers (Algeria)	
360.6	832	1.5	Mühlacker (Stuttgart) (Germany)	
355.9	843	50	London Regional (Brookmans Park)	
352.1	852	7	Graz (Austria). (*Relays Vienna*)	
348.8	860	7.6	Barcelona, EAJ1 (Spain)	
348.8	860	10	Leningrad, RV70 (Russia)	
345.2	869	11.5	Strasbourg, PTT (France)	
341.7	878	35	Brno (Brunn) (Czechoslovakia)	
337.8	888	15	Brussels II Velthem (Belgium). (*In Flemish*)	
335	896	5	Cadiz (Spain)	
334.4	897	1.9	Poznan (Poland)	
331.5	905	50	Milan (Italy). (*Relays Turin*)	
328.2	914	60	Poste Parisien (France)	
325	923	60	Breslau (Germany)	
321.9	932	10	Göteborg (Sweden). (*Relays Stockholm*)	
318.8	941	0.25	Dresden (Germany). (*Relays Leipzig*)	
318.8	941	1.5	Naples, INA (Italy). (*Relays Rome*)	
315.8	950	1.6	Marseilles, PTT (France)	
312.8	959	1.7	Cracow (Poland)	
312.8	959	10	Genoa, IGE (Italy). (*Relays Turin*)	
309.9	968	50	West Regional (Washford Cross)	
307	977	0.7	Radio Vitus (Paris). (*S.-W. Stn. on 43.75 m.*)	
307	977	0.75	Zagreb (Yugoslavia)	
304	986	13	Bordeaux Lafayette, PTT (France)	
301.5	995	50	North National (Manchester)	
298.8	1004	11	Tallinn (Estonia)	
296.1	1013	20	Hilversum (Holland). (*7 kW. before 4.40 p.m.*) (*V.A.R.A., A.V.R.O. and V.P.R.O. programmes.*)	
293.5	1022	0.7	Limoges, PTT (France)	
293.5	1022	2.6	Kosice (Czechoslovakia)	
291	1031	13.2	Viipuri (Viborg) (Finland). (*Relays Helsinki*)	
288.3	1040	50	Scottish National (Falkirk)	
288.3	1040	1	Bournemouth. (*Relay Station*)	
286	1049	0.8	Montpellier (France)	
284.8	1053	0.7	Lyons (Radio-Lyon) (France)	
283.6	1058	0.5	German Relays (Berlin, Magdeburg, Stettin)	
283.6	1058	0.5	Innsbruck (Austria). (*Relays Vienna*)	
282.2	1063	2	Lisbon CT 1AA (Portugal). (*Short-wave Station on 31.25 m.*)	
281.2	1067	0.75	Copenhagen (Denmark)	
278.8	1076	13.5	Bratislava (Czechoslovakia)	
276.5	1085	60	Heilsberg (Germany)	
273.7	1096	7	Turin (Italy)	
271.5	1105	1.3	Rennes, PTT (France)	
269.8	1112	20	Bari (Italy) (*Relays Rome*)	
267.6	1121	0.75	Valencia (Spain)	
267.4	1122	6.25	Nvireghaza (Hungary). (*Relays Budapest*)	
265.8	1128.5	1.3	Lille, PTT (France)	
263.8	1137	11.2	Moravska Ostrava (Czechoslovakia)	
261.5	1147	50	London National and West National	
259.3	1157	17	Frankfurt-a.-M. (Germany)	
259.3	1157	2.3	Trier and Cassel. (*Relay Frankfurt*)	
257.1	1167	10	Hörby (Sweden). (*Relays Stockholm*)	
255.1	1176	0.7	Toulouse, PTT (France)	
253.1	1185	5	Gleiwitz (Germany). (*Relays Breslau*)	
252	1193	1	Barcelona, EAJ15 (Assoc. Nat.) (Spain)	
249	1205	0.8	Juan-les-Pins, Nice (France)	
247.7	1211	10	Trieste (Italy). (*Relays Turin*)	
245.9	1220		Berne (0.5kW.) (Switzerland) (*relays Beromünster*); Eskilstuna (0.2kW.), Säffle (0.4 kW.) (Sweden) (*relays Stockholm*); Linz (0.5 kW.) (Austria) (*relays Vienna*); Turku (Abo) (0.5 kW.) (Finland) (*relays Helsinki*).	
244.1	1229	0.5	Basle (Switzerland). (*Relays Beromunster*)	
242.3	1238	1	Belfast (N. Ireland)	
240.6	1247	0.5	Stavanger (Norway)	
238.9	1256	2	Nürnberg (Germany). (*Relays Munich*)	
238	1260	1	Nimes (France)	
237.2	1265	3	Bordeaux, Sud-Ouest (France)	
235.5	1274	0.5	Kristiansand (Norway)	
233.8	1283	1.65	Lodz (Poland). (*Relay Station*)	
232.2	1292	0.25	Kiel (Germany). (*Relays Hamburg*)	
230.6	1301	—	Swedish Relay Stations	
227.4	1319		Flensburg, Bremen and Hanover. (*Relay Hamburg*)	
225.9	1328	10	Fécamp, Radio-Normandie (France)	
224.4	1337	1	Cork (Irish Free State) (*Relays Athlone*)	
219.9	1365	1.5	Béziers (France)	
218.5	1373	0.2	Plymouth	
218.5	1373	0.5	Salzburg (Austria). (*Relays Vienna*)	
217	1382	1.2	Dublin (*Relays Athlone*)	
217	1382	0.5	Königsberg (East Prussia). (*Relays Heilsberg*)	
214.3	1400	1	Aberdeen	
211.3	1420	1	Newcastle	
209.8	1430	1.25	Magyarovar, Miskole and Pecs (Hungary)	

SHORT-WAVE STATIONS OF THE WORLD

(N.B.—Times of Transmission given in parentheses are approximate only and represent G.M.T.)

Metres.	kc/s.	Call Sign.	Station.	Tuning Positions.
62.56	4,795	VE9BY	London, Ont. (Canada). (*Sun.* 06.00) ...	.....
58.31	5,145	OK1MPT	Prague (Czechoslovakia). (*Tues. and Fri.* 19.30)	.....
50.26	5,970	HVJ	Vatican State, Rome. (*Daily* 19.00) ...	.....
50.0	6,000	RW59	Moscow. (*Relays Komitern Stn.*)... ...	.....
50.0	6,000	EAR25	Barcelona, Radio Club (Spain). (*Sat.* 20.00)	.....
49.83	6,020	DJC	Zeesen (Germany)	.....
49.67	6,040	W1XAL	Boston, Mass. (U.S.A.)	.....
49.64	6,040	W4X B	Miami Beach, Florida (U.S.A.)	.....
49.58	6,050	GSA	Empire Broadcasting	.....
49.5	6,060	W3XAU	Philadelphia, Pa. (U.S.A.). (*Relays WCAU*)	.....
49.5	6,060	VQ7LO	Nairobi (Kenya Colony). (*Daily* 16.30)...	.....
49.5	6,060	W8XAL	Mason, Ohio (U.S.A.). (*Relays WLW*) ...	.....
49.43	6,069	VE9CS	Vancouver, B.C. (Canada)	.....
49.40	6,075	OXY	Skamlebaek (Denmark). (*Relays Copenhagen*)	.....
49.34	6,080	W9XAA	Chicago, Ill. (U.S.A.). (*Relays WCLF*)...	.....
49.22	6,095	VE9GW	Bowmanville, Ont. (Canada). (*Daily* 20.00)	.....
49.2	6,098	ZTJ	Johannesburg (S. Africa). (*Weekdays* 09.00) 11.00 [*Sat.* 14.30] *and* 17.00, *Sun.* 13.00 *and* 16.30.)	.....
49.18	6,100	W3XAL	Bound Brook, N.Y. (*Relays WJZ*) ...	.....
49.18	6,100	W9XF	Downers Grove, Ill. (U.S.A.)	.....
49.1	6,110	VUC	Calcutta, India. (*Daily* 13.00)	.....
49.02	6,120	W2XE	Wayne, N.J. (U.S.A.). (*Relays WABC*)...	.....
48.86	6,140	W8XK	East Pittsburg, Pa. (U.S.A.). (*Relays KDKA* 21.19–06.00)	.....
47.97	6,250	HJ3ABF	Bogota (Colombia). (*Daily* 15.00) ...	.....
48.05	6,243	HKD	Barranquilla (Colombia). (*Weekdays* 23.15)	.....
48.0	6,250	CN8MC	Casablanca (Morocco). (*Relays Rabat*) ...	.....
47.0	6,382	HCJB	Quito, Ecuador. (*Daily* 01.00)	.....
46.69	6,425	W3XL	Bound Brook, N.J. (U.S.A.). (*Relays WJZ*)	.....
45.38	6,610	RW75	Moscow. (*Relays Stalin Stn.*)	.....
45.0	6,667	FM8ER	Constantine (Algeria). (*Mon. and Fri.* 22.00)	.....
45.0	6,667	TGW	Guatemala City (Central America). (*Daily* 03.00)	.....
43.75	6,860	—	Radio Vitus, Paris. (*Daily* 20.30) ...	.....
43.0	6,970	EAR110	Madrid. (*Tues. and Sat.* 22.30)	.....
41.7	7,195	VS1AB	Singapore (Malay States). (*Sun. and Wed.* 15.30)	.....
40.3	7,443	HBQ	Radio Nations, Prangins (Switzerland) (*Sun.* 22.00–22.45)	.....
38.47	7,797	HBP	Radio Nations, Prangins (Switzerland). (*Sat.* 22.30–23.15)	.....
37.33	8,036	CNR	Rabat (Morocco). (*Sun.* 21.00)	.....
37.04	8,110	HCJB	Quito (Ecuador)	.....
33.50	8,955	TGX	Guatemala City (S. America)	.....
31.58	9,500	PRBA	Rio de Janeiro (Brazil). (*Daily* 21.30) ...	.....
31,55	9,510	VK3ME	Melbourne (Australia). (*Wed. and Sat.* 10.00)	.....
31.54	9,510	GSB	Empire Broadcasting	.....
31.48	9,530	W2XAF	Schenectady, N.Y. (U.S.A.). (*Relays WGY*)	.....
31.38	9,560	DJA	Zeesen (Germany). (*Daily* 22.00) ...	.....
31.35	9,570	W1XAZ	East Springfield, Mass. (U.S.A.). (*Relays WBZ*)	.....
31.3	9,580	HBL	Radio Nations, Prangins (Switzerland). (*Sat.* 22.00–22.15)	.....
31.29	9,585	GSC	Empire Broadcasting	.....
31.28	9,590	W3XAU	Philadelphia, Pa. (U.S.A.). (*Relays WCAU*)	.....
31.28	9,590	VK2ME	Sydney (Australia). (*Sundays*)	.....
31.25	9,598	CT1AA	Lisbon (Portugal). (*Tues. and Fri.* 22.00–00.00)	.....
31.0	9,675	T14NRH	Heredia (Costa Rica). (*Daily* 22.00 *and* 02.00)	.....
30.0	10,000	EAQ	Aranjuez (Spain). (*Daily* 22.30, *Sat.* 18.00)	.....
28.98	10,350	LSX	Buenos Aires (Argentina). (*Daily* 20.30)	.....
26.83	11,180	CT3AQ	Funchal (Madeira). (*Tues. and Thurs.* 10.30–12.30)	.....
25.63	11,705	FYA	Pontoise (France). (*Colonial Stn. E-W, daily* 20.30)	.....
25.6	11,720	VE9JR	Winnipeg (Canada). (*Daily* 14.30) ...	.....
25.57	11,730	PHI	Eindhoven (Holland)	.....
25.53	11,750	GSD	Empire Broadcasting	.....
25.5	11,760	DJD	Zeesen (Germany)	.....
25.45	11,790	W1XAL	Boston, Mass. (U.S.A.)	.....
25.4	11,810	2RO	Prato Smeraldo, Rome. (16.15–23.30) ...	.....
25.36	11,830	W2XE	Wayne, N.J. (U.S.A.). (*Relays WABC*)...	.....
25.36	11,830	W9XAA	Chicago, Ill. (U.S.A.). (*Relays WCFL*) ...	.....
25.28	11,865	GSE	Empire Broadcasting	.....
25.27	11,870	W8XK	East Pittsburg, Pa. (U.S.A.). (*Relays KDKA* 21.19–03.00)	.....
25.25	11,880	FYA	Pontoise (France). (*Colonial Stn. N-S*) ...	.....
25.0	12,000	RNE	Moscow. (*Relays R.V.1*)	.....
23.38	12,830	CNR	Rabat (Morocco). (*Sun.* 12.30)	.....
19.84	15,120	HVJ	Vatican State, Rome. (*Daily* 10.00) ...	.....
19.81	15,110	GSF	Empire Broadcasting	.....
19.73	15,200	DJB	Zeesen (Germany). (*Daily* 13.00–22.30)...	.....
19.72	15 210	W8XK	East Pittsburg, Pa. (U.S.A.). (*Relays KDKA* 15.00–21.18)	.....
19.68	15,244	FYA	Pontoise (France). (*Colonial Stn. E-W*)...	.....
19.64	15,270	W2XE	Wayne, N.J. (U.S.A.). (*Relays WABC*)...	.....
19.57	15,330	W2XAD	South Schenectady, N.Y. (U.S.A.). (*Daily* 20.00)	.....
16.89	17,760	DJE	Zeesen (Germany)	.....
16.88	17,770	PHI	Eindhoven (Holland)	.....
16.87	17,780	W3XAL	Bound Brook, N.J. (*Relays WJZ*) ...	.....
16.87	17,780	W9XAA	Chicago, Ill. (U.S.A.). (*Relays WCFL*) ...	.....
16.87	17,780	W9XF	Downers Grove, Ill. (U.S.A.)	.....
16.86	17,790	GSG	Empire Broadcasting	.....
13.97	21,470	GSH	Empire Broadcasting	.....
13.92	21,540	W8XK	East Pittsburg. (12.00–19.00)	.....
12.30	24,380	VE9GW	Bowmanville, Ont. (Canada)	.....

A Well-equipped Amateur Transmitting Station



Mr. J. C. Lee operating his station G6JL at Spinney Lane, Kettering. Telegraphy and telephony are conducted on 7,166 and 14,332 kc/s., and also on 1,730 and 1,985 kc/s.

FOREIGN BROADCAST GUIDE

KALUNDBORG

(Denmark).

Geographical position: 55° 40′ 18″ N.; 11° 04′ 20″ E.

Approximate air line from London: 535 miles.

Wavelength: 1,153.8 m. Frequency: 260 kc/s. Power: 60 kW.

Standard time: Central European (one hour ahead of G.M.T.).

Standard Daily Transmissions

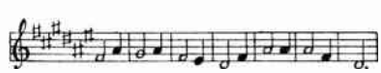
(Relays Copenhagen)

06.00 G.M.T., physical exercises (Sundays 07.00); 09.10, relay of Sacred Service from Cathedral (Sun.); 11.00, time signal and chimes from Copenhagen Town Hall; 12.30, talks in English, German and French (Sun.); 16.00, relay of Sacred Service (Sun.); 17.00, talks, news, etc.; 19.00, time signal and chimes; 19.30, main evening entertainment; 22.10, dance music (relayed), interrupted at 23.00 by time signal and chimes. Usually closes down 23.30.

Announcers: Man and woman; the latter usually for daylight broadcasts only.

Call: *Kalundborg-Kobenhavn og Danmarks Kortbolgesender* (short wave transmitter).

Opening signal: Musical box melody repeated *ad lib.*:



Before closing down the studio prior to an outside relay of dance music, the announcer gives the following day's programme, concluding with: *God nat, God nat,* and three strokes on a gong.

Relays: Copenhagen, 281 metres (1,067 kc/s.) 0.75 kW. Skamlebaek (OXY), 49.4 metres (6,075 kc/s.) 0.5 kW.

BROADCAST BREVITIES

By Our Special Correspondent

Better Than Loch Ness Monster

NO better breeding ground for rumour can be found than the North of Scotland at the present time, and I believe that even the Loch Ness monster is yielding pride of place to the B.B.C. mobile transmitter, which is said to be making wraith-like appearances on the misty moors and even in the Firth of Cromarty.

Island Stronghold ?

One old wives' tale has it that the Black Isle, some hundreds of yards from the Cromarty shore, is to be turned into a sort of B.B.C. Heligoland, which Press representatives and others will only be able to visit by boat.

Nothing Doing ?

How true this story may be can be gathered from the reply which I got from the B.B.C. engineering department when asking for confirmation. "Well," said the engineer, "it *is* an idea, isn't it?"

Still Searching

No site has yet been chosen, but both Inverness and Culloden Moor seem to be in the running.

Down Newcastle way, too, the engineers are still testing with a mobile transmitter, but no site has yet been found for the North-Eastern Regional.

30-line Television to Stay

I AM able to state that a decision has been taken to continue indefinitely the 30-line television transmissions by the Baird Company from Broadcasting House. This disposes of the disturbing rumour that the simpler form of transmission would be entirely supplanted by the high definition tests at the end of March.

It is likely, however, that the time-table of 30-line transmissions will be modified. Possibly, they may be confined to one or two evenings a week.

An Organ for Athlone ?

THE admittedly beautiful tones of the B.B.C. organ seem to have struck a responsive chord in the breasts of other broadcasting organisations, and there is quite a big demand nowadays for new studio organs. Strong pleas are being made for an organ for the Dublin studio, which supplies the programmes broadcast from Athlone. It will be interesting to see whether Ireland can produce an instrument which is a worthy rival of the organ in Portland Place.

Night Cashier

A NEW little office has been opened in one of those side corridors on the ground floor of Broadcasting House, bearing on the door the romantic sign, "Night Cashier." It is here that the artistes call immediately after completing their performance to receive their cheques.

It is the invariable rule in the B.B.C. that an artiste shall be paid immediately after the broadcast. This rule, as I understand, has never been broken save in the case of a certain famous Scots comedian who believed in C.O.D.

Prince at Broadcast Cabaret Performance

THE Radio Manufacturers' Association is to be honoured by the presence of His Royal Highness the Prince of Wales on the occasion of the annual banquet at the Savoy Hotel on Monday next, November 27th. A cabaret performance following the banquet is to be heard by London Regional listeners.

Jack Hylton Again

JACK HYLTON, I am glad to hear, expects to be sufficiently recovered from his illness by December 2nd to be able to appear in the studio with his Boys and give an hour's broadcast for National listeners.

The People Who Count

FOR a moment I suspected a huge practical joke when running a swift eye over Mr. S. A. Moseley's new "Who's Who in Broadcasting." For the biography of Mr. Rees was followed by that of Dr. J. M. Rendall. There was no REITH!

Then I turned the page and found that the great name was merely in its wrong order. However, Mr. Moseley's own name was in its right order.

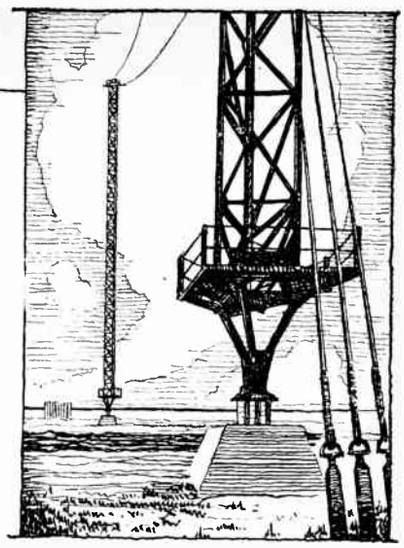
Absentees

Of course, it is easy to criticise a work of this type. Looking for omissions makes a good game for a wet day. I was surprised that no room could be found for such a big figure as G. K. Chesterton, the B.B.C. book critic, and it was disturbing to find no mention of that indefatigable intermediary between the B.B.C. and the Press, Mr. Gladstone Murray.

Useful Information

However, this "Who's Who" abounds in piquant information. Big Ben is included as one of the "personalities," and we are told that Mr. Val Gielgud "believes in Napoleon."

MID-OCEAN CONTROL ROOM. The microphone and short-wave receiver in the Radio cabin of the s.s. "Jacob Ruppert," which will pick up the weekly broadcasts from the Byrd Antarctic Expedition for relaying over the American Columbia network this winter.



Where the Money Goes

JUST one farthing of what you and I pay for our wireless licences goes in fees to the B.B.C. Governors. This is one of the exciting facts disclosed in an unusual table printed in the B.B.C. Year Book out today (Friday). For the first time, I believe, the B.B.C. tells the world just how the net amount of 5s. 10d. available to it per licence is distributed among the various activities.

Programmes, including artists' fees, orchestras' news service and programme staff salaries account for 2s. 6½d.

Engineers Get Elevenpence-Halfpenny

Only 11½d. is consumed by the engineering side, and this covers maintenance of plant, power, research staff salaries, and expenses.

Nasty items like rent, rates, bank interest, etc., use up another 7½d. Replacements of furniture and wireless plant take 4½d., administrative staff salaries 3½d., and the pension fund 1d.

The remaining 11½d. goes as provision for capital expenditure.

Gramophones and Microphones

Taken as a whole, the Year Book maintains the bright and informative standard of its predecessors. Of special interest, in view of recent controversies, is the article on the application of sound recording to broadcasting.

Wireless World readers would also be interested in the notes on recent microphone developments, particularly in the direction of eliminating resonances.

Pre-War Vintage

"SCRAPBOOK of 1913," a microphone *mélange* dealing with twenty years ago, has been arranged by Leslie Baily, and will be presented by D. H. Munro in the National programme on December 11th. The pages will be turned by Bransby Williams; but this is no history book, no portentious cavalcade—just a scrapbook of cherished fragments.

Sun Blinds

IN *The Wireless World* of July 7th last I said that the suggested sun-blinds on the west façade of Broadcasting House would probably be fixed just as the November fogs were beginning. They were putting them up last week.

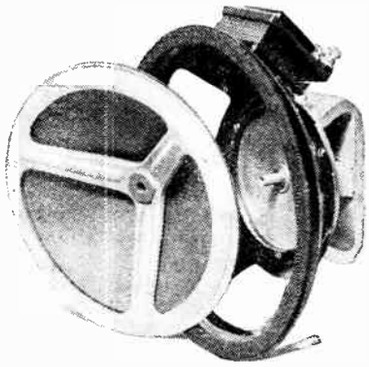
NEW APPARATUS REVIEWED

Latest Products of the Manufacturers

R. & A. "ALPHA" LOUD SPEAKER

THE method which has been adopted in this unit for mounting and centring the diaphragm and speech coil is probably the best that has so far made its appearance in commercial moving coil loud speakers. Instead of being attached to the outer chassis, the periphery of the cone is supported on a separate frame which is accurately located in the centre-pole of the permanent magnet. Thus, the alignment of the speech coil is unaffected by any damage which may be sustained by the outer chassis in its primary capacity of affording protection to the diaphragm. Further, the diaphragm assembly can be removed for the purpose of cleaning the air gap and replaced without any fear of disturbing the alignment.

On test, the unit showed itself to possess an electro-acoustic efficiency which compared very favourably with the mains-energised standard with which it was compared. The overall response has been designed to give a good balance of tone at inputs of the order of 300 to 500 milliwatts, though the unit is well able to handle powers of the order of 5 watts. The range of maximum response is from 70 to 4,500 cycles with a bass resonance at 90 cycles and a region of increased output between 2,500 and 3,500 cycles. Below 70 cycles the output, although considerably less than the general level, is free from frequency doubling, and above 4,500 cycles the response tails off gradually to a cut-off at about 11,000 cycles.



R. & A. "Alpha" loud speaker with diaphragm assembly removed for cleaning the air gap.

Output transformers are supplied for single or push-pull output stages, the former giving six ratios with effective loads from 1,500 to 15,000 ohms. The price is 52s. 6d., and the makers are Reproducers and Amplifiers, Ltd., Frederick Street, Wolverhampton.

MILLGATE SAFETY FUSE H.T. BATTERY

WHILE an H.T. fuse is often recommended for battery sets it is most unusual to find a safeguard of this nature actually embodied in the battery. Such, however, is the case in the Millgate Safety Fuse H.T. batteries, a 60-volt unit of which we tested recently. The fuse is of the screw-in type rated at 150 mA. and fitted with a standard flash lamp base so that in an emergency a small lamp could be employed in its place.

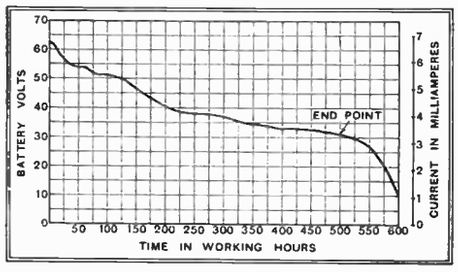
The battery measures 9½in. × 3½in. × 3in. overall and is tapped at 12, 18 and thence in six-volt steps up to 60 volts. The fuse is at the negative end.

As it is a standard-capacity model the discharge was commenced at just below 7 mA. through a resistance of fixed value and for intermittent periods, with like intervals for recuperation. On this basis a useful life of 500 working hours was obtained by continuing the discharge until the voltage fell to the equivalent of 0.75 volt per cell or about half the nominal voltage.

Millgate 60-volt battery embodying a safety fuse.

It is of some interest to record that this arbitrary end-point coincided with the natural cut-off of the battery, for, as will be seen from the curve, it did not survive for long after. The voltage is maintained at a most satisfactory level during this period, and in this respect it compares very favourably indeed with the best in its class.

Our tests gave a watt-hour capacity of 95.5 for the battery or 2.3 watt-hour per cell, the battery comprising 41 cells. In view of the long discharge it was not surprising to find the zincs partially disintegrated, yet there was no creeping beyond the limits of the waxed cardboard partitions. It would seem that the battery has given its full measure, and at the price of 5s. 6d. is undoubtedly very good value for money. A 120-volt model of the same capacity is available at 11s.



Discharge curve of Millgate Safety Fuse 60-volt H.T. battery.

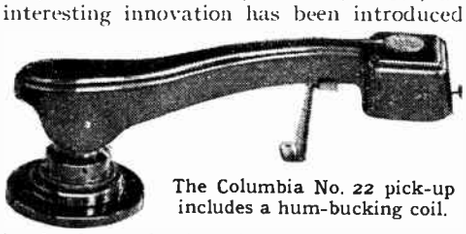
The makers are Chorlton Metal Co., Ltd., Millgate House, Blossom Street, Manchester, 4.

CLIMAX S.4 RECEIVER.

IN connection with the review of this receiver in our issue dated November 10th, the makers point out that the price given does not include the pedestal, for which an extra 2 guineas is charged.

COLUMBIA NO. 22 PICK-UP

IN the latest pick-up designed by the Columbia Graphophone Co., Ltd., 98-108, Clerkenwell Road, London, E.C.1, an interesting innovation has been introduced

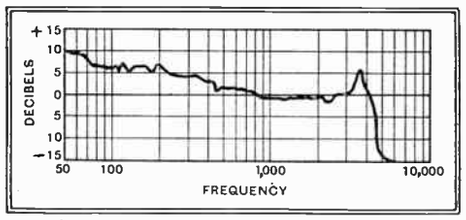


The Columbia No. 22 pick-up includes a hum-bucking coil.

in the form of a hum-bucking coil which is connected in opposition to the pick-up coil and neutralises all hum due to stray fields from the turntable motor.

The pick-up itself has an excellent frequency characteristic, the output in the horizontal middle section being of the order of 0.3 volts R.M.S. The rise in the bass is of the order of 10 db., which is approximately the increase required to correct for recording. The armature resonance at 3,600 cycles is 6 db. on open circuit, but would be reduced when using the recommended volume control of 50,000 ohms.

The moulded tone arm is well designed and lifts vertically for needle changing, a spring-loaded catch being arranged to hold it in this position. The price of the unit is 32s. 6d.



Frequency response of Columbia No. 22 pick-up with Columbia "Talkie" needle.

CATALOGUES RECEIVED

Varley, 103, Kingsway, London, W.C.2.—Radio components.

General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.—Radio receivers.

Baird Television, Ltd., 133, Long Acre, London, W.C.2.—Baird grill cell unit.

Harris and Stern, Ltd., 26, Helmet Row, Old Street, London, E.C.1.—The "Teeback" hacksaw frame.

Lectro Linx, Ltd., 79a, Rochester Row, London, S.W.1.—"Clix" connectors, plugs, sockets, terminals, valve holders, etc.

Pye Radio, Ltd., Africa House, Kingsway, London, W.C.2.—Leaflet describing superheterodyne receivers.

The Peto-Scott Co., Ltd., 77, City Road, London, E.C.1—Illustrated catalogue of radio cabinets, including containers for loud speakers and radio-gramophones, and also the new Metaplex metal-sprayed baseboards.

Wurlitzer Lyric Radio, Ltd., 33, King Street, Covent Garden, London, W.C.2.—Leaflets describing the Lyric Minor universal midget superheterodyne and the Lyric Cruiser car set.

British Blue Spot Co., Ltd., 94-96, Rosoman Street, Rosebery Avenue, London, E.C.1.—Leaflet describing the Blue Spot Class "B" output stage, complete with loud speaker, for addition to existing receivers.

The Marconiphone Company, Ltd., 210, Tottenham Court Road, London, W.1.—New descriptive folder dealing with Marconiphone receivers and radio-gramophones.

Television Explained

V—Mechanical Scanning Systems

MECHANICAL scanning methods are not confined to the Nipkow disc, and alternatives such as the mirror drum are often employed successfully. In this article a description is given of the chief systems which are now used or which are interesting from a technical standpoint.

THE action of the simplest form of mechanical scanning, the Nipkow disc, has already been dealt with; there are, however, many alternatives which find considerable use in modern television equipment. Undoubtedly, the chief of these is the mirror-drum. The Nipkow disc is replaced at transmitter or receiver, or both, by a drum the periphery of which carries a series of small mirrors; there is one mirror for every scanning line required, and the mirrors are all identical save for their angle of attachment to the drum.

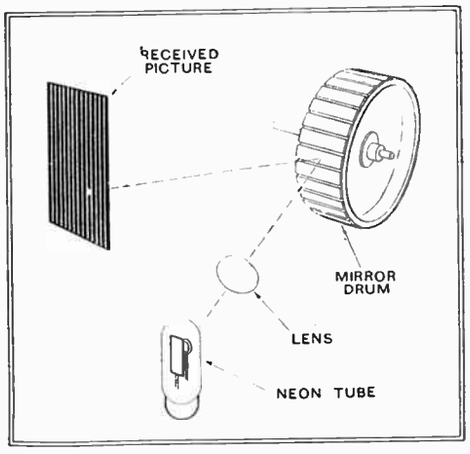
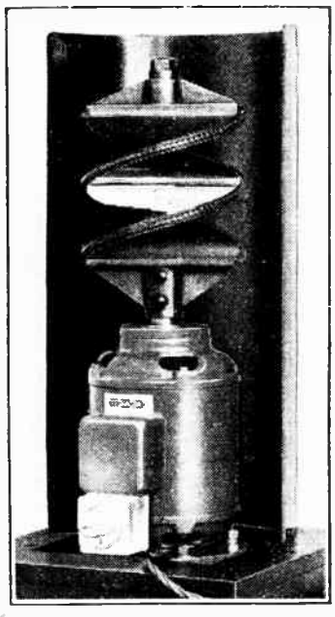


Fig. 1.—Mirror drum apparatus is here depicted diagrammatically. The drum rotates at high speed and each mirror is set at a slightly different angle.

The arrangement of the receiver is depicted in Fig. 1. The light from the neon tube passes through an optical system for focusing purposes and falls upon one of the mirrors on the drum. It is then reflected on to the viewing screen, and it will be readily appreciated that the precise point on the screen upon which it falls will depend upon the precise angle of the mirror in two planes. The position of the spot on the screen in a horizontal direction depends upon the angle of the mirror relative to the axis of the drum, assuming the neon tube and screen to be correctly placed. The vertical position, however, depends upon the angular displacement of the mirror around the circumference of the drum.



The Tekade mirror-screw employed in Germany.

The drum is rotating, so that the spot of light moves across the screen in a vertical direction. If the angle of each mirror were made the same, the result would be the appearance of a single vertical line of light upon the viewing screen. Each mirror, however, is mounted at a slightly different angle, so that the light reflected from the first causes the light spot to traverse a line at the extreme edge of the screen, the light from the second mirror a line immediately adjacent to this, and so on, until the last mirror gives rise to a line at the other edge of the screen. The whole process is then repeated.

Vibrating Mirror System

The process achieves the same result as the Nipkow disc, and it has the merit of greater optical efficiency, provided that suitable mirrors are used. There are many variations in practice, and the drum does not necessarily take the form shown in Fig. 1. This is the usual form, certainly, but a modification has been derived in Germany which has the merit of occupying far less space. It is usually known as the mirror screw, and its operation will be seen from the photograph on this page, which is self-explanatory when it is remembered that the screw is rotating about its axis, and that the scanning is carried out horizontally in accordance with the usual practice outside the British Isles.

Other arrangements of mirrors have been tried out, of which the most important is perhaps that employing oscillating mirrors instead of rotating arrangements. This is shown in Fig. 2, and it will be seen that the mirror E oscillates rapidly about its axis AB, while the mirror F oscillates slowly about an axis CD at right angles to that of the former. The beam of light GH from the neon tube falls upon the mirror E, and is reflected from it along the line HI. Now, the angle between GH and HI depends upon the angle between GH and the surface of the mirror, and is just double the latter angle. Since the mirror is oscillating, the angle between GH and HI is continually altering, and the result is to cause the point I where the beam HI impinges upon the surface of the mirror F to move in a vertical direction.

This mirror F, however, is also oscillating about the axis CD, so that the angle between HI and IJ is changing. The result of the oscillations of both mirrors is to cause the spot of light on the viewing screen to move both vertically and horizontally. The oscillation of mirror E makes the spot move vertically, and that of mirror F gives a horizontal deflection. The oscillation of the former, therefore, is rapid, and gives the scanning lines, while the slowed oscillation of mirror F results in successive lines being correctly displaced sideways.

So far, this system has not proved of great service, for synchronisation of the oscillation frequencies of the mirrors proves far more difficult than in the case of a simple rotating disc or drum. From a theoretical standpoint, however, it is undoubtedly attractive.

Mechanical Difficulties

With the present 30-lines transmissions mechanical methods of reception can be entirely satisfactory, but it is doubtful whether they can provide the necessary accuracy for the domestic reception of higher grade pictures. Assuming that some form of rotating mirror drum be used, an increase in the number of scanning lines means an increase in the size of the drum. This, in turn, means increased weight, which carries with it the necessity for a more powerful driving motor and greater difficulty of synchronisation. An increase in the number of pictures a second, which is also desirable, means an increase in the

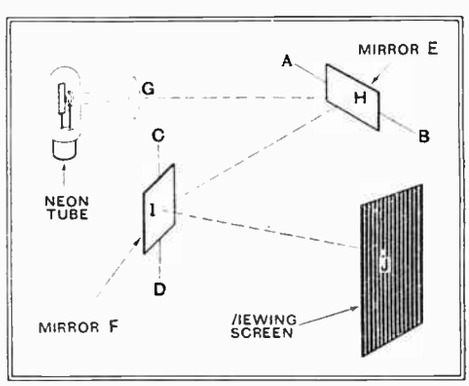
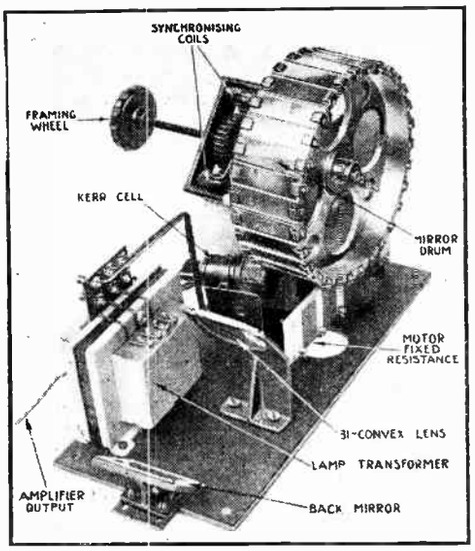


Fig. 2.—A system of scanning involving vibrating mirrors. The action is explained in the text.

Television Explained—

speed of rotation of the drum, which introduces further difficulties. It is, of course, quite possible to use a mirror-drum for 120-line transmissions with twenty-five pictures a second, and good quality pictures have been transmitted in this way. Although these pictures could doubtless be received with the aid of a similar drum, its dimensions and the type of motor required to drive it are unlikely to commend themselves for domestic reception, and it is the usual practice, therefore, to abandon mechanical methods for high-quality picture reception, although they may still be employed in transmission. The cathode-ray tube is becoming more and more applied to television reception, and it appears likely to displace mechanical methods entirely.



The arrangement of parts in mirror drum equipment. In this particular case a Kerr cell is used, to modulate a source of light, instead of a neon tube.

Apart from the space required to accommodate the mirror drum and its driving motor, it is a matter of considerable difficulty to obtain completely silent operation, and the whine of the motor can become troublesome. Moreover, cabinet work has to be extremely rigid if the vibration is not to affect the operation. None of these difficulties is apparent with the cathode-ray system, for the arrangement is entirely electrical. The questions involved, therefore, will be considered in some detail in the next article.

Radio Amateur Call Book

TRANSMITTERS and short-wave listeners will welcome the autumn edition of this semi-official list of all known amateur transmitting stations of the world. Each succeeding issue is bulkier than the last, and in itself provides good evidence that interest in short-wave working among amateurs is not waning.

It is perhaps a matter for regret that some of the supplementary information has had to be slightly curtailed, but the useful list of Commercial High Frequency Stations is considerably enlarged so that for all practical purposes the book in its growth retains all the particulars likely to be required by its users.

Copies may be obtained in Great Britain from Mr. F. T. Carter, Flat A, Glencagle Mansions, Streatham, London, S.W.16. Price 6s. 6d. for a single copy, or 21s. for the year.

DISTANT RECEPTION NOTES

Is Fading on the Decline?

A WEEK or two ago I mentioned that owing to the strength at which both Stuttgart and Munich were being received it was difficult to believe that the old low-power transmitter was in use in either case. Both stations still continue to provide first-rate reception. Munich has come in at full loud speaker strength whenever I have tried for it recently, whilst Stuttgart is readily separable—sideband splash excepted—from the London Regional. Were Stuttgart working with an output of only 1.5 kilowatts the selectivity of the set would have to be such that the London Regional was thousands of times "down" only 11 kilocycles off resonance.

Though I have not heard announcements to the effect, I think that the new Tegel station of Berlin Witzleben must be conducting test transmissions on comparatively small power. I have heard Berlin on 419 metres several times during the past week, but not yet at enormous strength.

There is extraordinarily little fading at the moment on the medium waveband, and what there is is of very mild type. With A.V.C. it is completely eliminated, and even without A.V.C. it is seldom bad enough to be at all troublesome.

Ten-fold Power Increase

Transatlantic reception is extraordinarily good when conditions are at all favourable. As I predicted some time ago, American stations on wavelengths above 350 metres are now beginning to come in very well. Amongst stations frequently logged during the past few weeks are WGY (379.5 metres), WJZ (394.5 metres), and WLW (428.3 metres).

WLW, by the way, is still transmitting with 50 kilowatts in the aerial, but it will not be long before ten times this power is used in experimental transmissions from the new plant.

On the long waveband Luxembourg is again badly heterodyned and Kalundborg is occasionally affected. Oslo on one recent evening was almost blotted out by continuous-wave morse signals. Huizen is sometimes completely free of the interference that has been troublesome for so long, and when this is the case first-rate reception is assured. Radio-Paris, Zeesen and Warsaw are all reliable stations, and Motala is generally to be heard.

Some very fine transmissions are to be heard at the top of the medium waveband. Budapest is now in splendid form, whilst Munich, Vienna, Brussels No. 1 and Florence seldom fail to provide full loud speaker volume. Prague is usually very good, but has been varying a little. Langenberg and Lyons Doua are reliable. Beromünster is again heterodyned in the evening, though generally well received in the afternoon. Rome lives up to its reputation as one of the best of European stations and Stockholm is often almost as good.

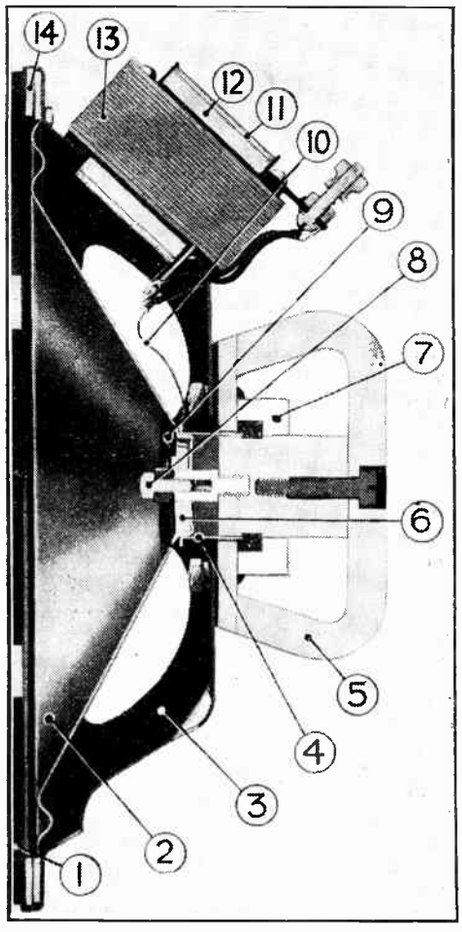
For some reason Katowice is not so well heard now as it was some weeks ago. Toulouse is invariably a good signal, and Madrid Union Radio is to be heard once more.

Leipzig is strong and reliable. Hamburg varies greatly from night to night, being sometimes excellent and sometimes quite faint. Strasbourg, Brussels No. 2, Milan, Poste Parisien and Breslau are generally reliable, though Milan and the Poste Parisien are occasionally heterodyned. Brno makes only rare appearances in the log, but when it is received it is always at good strength. Bratislava is badly interfered with, but Hilversum and Heilsberg come through excellently. Turin is generally a good signal and Frankfurt is always worth attention. Trieste, Nürnberg and Fécamp are well heard in the lower part of the medium waveband, whilst both Toulouse PTT and Hörby provide occasional good reception.

D. EXER.

An Interesting Exhibit

VISITORS to the various Radio Exhibitions which have been held during recent months have been afforded a unique opportunity of examining modern methods of loud speaker construction and assembly in the sectionalised models exhibited by Reproducers and Amplifiers, Ltd., of Wolverhampton. The skill with which the smallest screws, and even the transformer windings, have been sectioned is a wonderful example of the instrument makers' art, and the function of every component part can be clearly seen.



Sectional model of the R. & A. "Challenger" moving-coil loud speaker. The component parts are as follow:—1, baffle felt; 2, diaphragm; 3, chassis; 4, speech coil; 5, magnet; 6, speech coil pressure ring; 7, speech coil dust excluding washer; 8, spider locking screw; 9, centring spider; 10, speech coil lead; 11, transformer secondary winding; 12, transformer primary winding; 13, transformer core; 14, diaphragm clamping section.

Letters to the Editor:—

Speaker Response Curves

High Quality: Valves or Stages: Output Control: Disc Records

The Editor does not hold himself responsible for the opinions of his correspondents

Speaker Response Curves

WHILE no doubt the majority of the readers of *The Wireless World* are familiar with an ordinary curve, I think it should be clearly emphasised that the interpretation of a loud speaker response curve is very different from that of a curve correlating two specific electrical functions.

Whereas the general level and shape of a transformer response curve, for example, gives a visual indication of the true performance of the transformer, the general shape of a speaker response curve is not necessarily an indication of its actual performance, and the curve requires careful interpretation.

Investigation of the response of any loud speaker reveals that the relative difference in output at two very near frequencies is quite appreciable. Actually, if one requires a very accurate indication of the speaker performance it is necessary to plot an exceptionally large number of points, and these points should preferably be plotted at random frequencies where it is noticed that marked deviations in the output arise. If, say, 80 to 100 points are taken, these can then be joined by a substantially curved line, and one obtains a very good approximation of the general nature of the response of a speaker.

When investigating speaker responses in a general manner it is customary to plot only quite a small number of points, perhaps some thirty to forty, and it is then general to join these by a straight line. The resulting "curve" indicates at its various peaks the relative output at the frequencies at which the points were taken. This curve indicates the general nature of the relative response, but obviously it gives no indication of the response on the various straight portions, that is, between the points at which the output has been measured.

Both types of curve are in general use, and they each serve their specific purpose, and accordingly it seems to me very desirable that the lay reader should appreciate the significance of each type so that he may draw his own conclusions when studying a response curve.

It should also be realised that response curves are taken by measuring the output of a capacity microphone when the speaker is energised by a sine wave. Should, however, the speaker introduce frequency doubling or other wave form distortion no indication of this is given by the curve, which is obtained by plotting the amplified microphone voltage, which in many cases is of unknown wave form. The actual performance of a speaker can, therefore, only be obtained by simultaneous oscillograph examination, or, alternatively, some electrical system of wave form distortion or harmonic analysis.

Finally, it must be remembered that these measurements are made under static conditions and the curve given by a microphone output is no criterion of the ability of a speaker to deal with transients which have such a marked bearing upon the all-important question of attack. Accordingly, the speaker response curve to my mind should be regarded only as a "pointer" rather than a graphic delineation of electrical and acoustic constants.

Watford. PAUL D. TYERS.

"Mystery" Station

WITH reference to the controversy with regard to the "Mystery" station causing so much trouble with Huizen transmissions, may I respectfully state that this is most definitely not a Rumanian station?

After Huizen has closed down, I have, on many occasions, picked up the interfering station, which, at all times, has been radiating a sort of inter-station discussion in Russian, in common with other Soviet transmitters. There is no Rumanian station using Russian, and this is definitely a Soviet station.

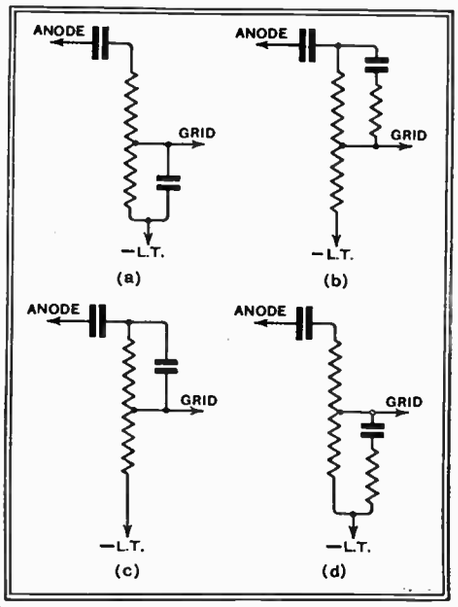
LEOPOLD FRIEDMAN.

Edgware, Middlesex.

High Quality

A HIGH quality receiver should respond similarly to the modulation of signals of all wavelengths in a given waveband.

The *Wireless World* Autotone (which was described in theory and in practical form in issues published at the end of 1931 and beginning of 1932) is the only receiver that theoretically fulfils this condition.



(a) To reduce treble; (b) to reduce bass; (c) to increase treble; (d) to increase bass.

To preserve transients, transformers and any inductive L.F. coupling must be avoided. This means that a sharp cut-off in the L.F. circuits to remove heterodynes is not possible. However, a large degree of tone correction can be obtained with R.C. couplings in suitable combinations as shown in the figure.

To obtain a sharp cut-off at the top of the spectrum, I suggest arranging for a peak separation in two I.F. transformers of 10 kc/s or more according to conditions and requirements. Further, I suggest using a valve to provide reaction on the single H.F. circuit to provide the necessary selectivity.

By means of mechanical arrangements similar to those used in the Autotone, the H.F. resistance of this signal tuned circuit can be kept constant at a low value throughout the waveband, though, of course, not so low as in the Autotone. By this means a straight line L.F. response can be obtained throughout the waveband.

F. L. INGRAM.

Kingston-on-Thames.

Correspondence, which should be as brief as possible, should be addressed to the Editor, "The Wireless World," Dorset House, Stamford Street, S.E.1, and must be accompanied by the writer's name and address

Output

I HAVE just read with interest the letter by "Lead-in" on output. On reading the last sentence, stating that the example is a strong argument for the use of a double output stage when separate high- and low-note speakers are used, I am led to believe that the writer himself does not see where the "obvious" fallacy lies.

When 25 volts peak of f1 and 25 volts peak of f2 are together applied to the grids loading them with 50 volts peak the output will be 8 watts, and not 4 watts, as stated. For this reason "Lead-in" has not made me decide to fit a double output stage to feed my speakers, which are of the type mentioned. H. GRAYSON.

Manchester.

Valves or Stages?

WHILE the system of describing a wireless receiver by its number of stages is perhaps better than the number of valves system, it is by no means ideal, for as pointed out in the letter from Mr. G. A. Taylor in your issue of September 30th, an A.V.C. diode can be counted as a stage without improving the receiver from the point of view of range.

The layman buying a receiver wants an indication of the volume of sound a receiver will produce when operating on a given station, or, alternatively, an indication of the number of stations that can be received at a given volume. Hitherto with a straight battery-driven set the number of valves could be taken as a rough guide, but with modern developments such a procedure is liable to be misleading.

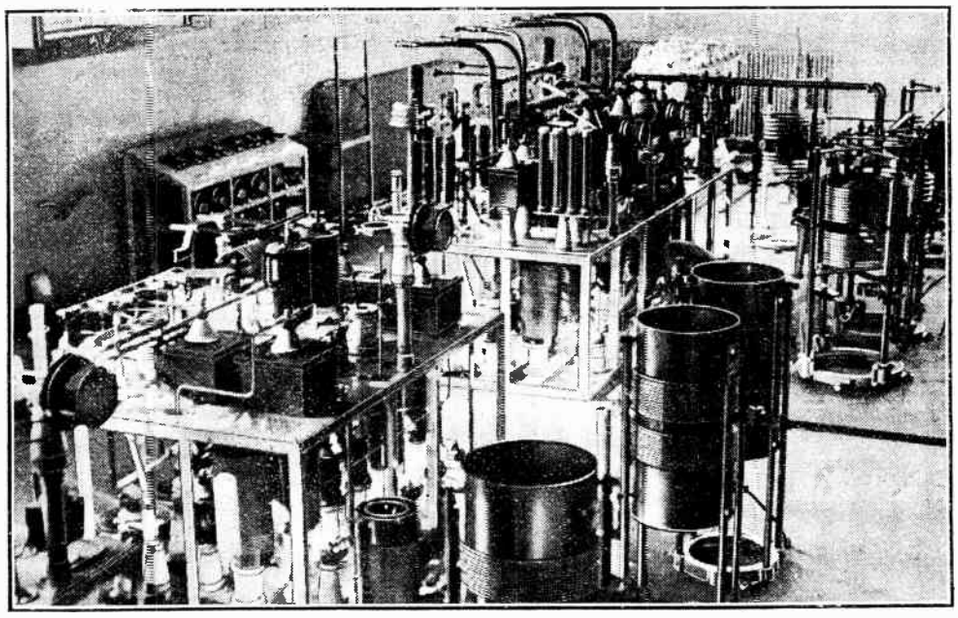
The ideal method would be to describe a receiver by its overall amplification. Since the actual amplification obtained will depend on the efficiency of the circuits in addition to the valves the actual amplification could not be readily checked, and misrepresentation would be possible. To avoid this the figure obtained by multiplying together the amplification factors of all the valves which contribute to the over-

all magnification of the set could be used. This figure could be easily checked from the valve makers' catalogues. Since this figure would run into millions a unit consisting of a million magnifications could be devised.

This system would be similar to the horse-power method of rating cars.

Plumstead. W. HARMER.

THE letter from R. J. Cotterswood in your issue for October 27th seems to deal very thoroughly with the question of how receivers shall be designated, and, whilst his suggestions would probably be ideal and indicate pretty clearly the performance of receivers, it is unfortunate that, speaking from the general commercial point of view, the ladies are mainly responsible for choice of wireless sets, and their choice is very largely in the direction of pretty-pretty cabinets, to the exclusion of what may be inside, and, until such time, if ever, that they develop a real interest and intelligence as to what is inside, the question of a precise specification is not of much importance, although, as I explained in my original letter, I consider this should always be included in the technical details of the set, which should be as full as possible, but which are really understood by a very tiny minority.



GERMANY'S LATEST. The new 100 kW. station or "Grossrundfunksender" at Tegel near Berlin, is already testing. Above is a view of the output stages of the transmitter.

My main objection to the specification of stages was the difficulty in being quite clear as to the definition of a stage, since, for example, in a superheterodyne receiver if the oscillator portion consists of a stage it is just as logical for the A.C. rectifier to be included as a stage as well, or possibly the oscillator and first detector might be combined as one stage, in which case, of course, they line up with the valve position in those sets which employ a combined oscillator-modulator, such as the Heptode.

On the other hand, the number of valves in a set is a thing that can readily be seen, whereas the specification of stages leaves the matter open to endless wangling, which is, perhaps, more common to the radio industry than any other.

In conclusion, I should like to apologise most humbly to "Free Grid," and also to your aforementioned correspondent, for having inadvertently reversed the direction of the electron stream, a thing which, in these days of bigger and better electrons, should be unheard of. J. BAGGS

Manchester.

Output Control

THE complaint regarding the annoying activities of the B.B.C. output control engineers during organ broadcasts appears in your Correspondence columns at an opportune moment. Whatever reasons might be advanced in favour of exercising this control in the case of "outside" broadcasts, it is difficult to understand how it can be justified in connection with the B.B.C.'s own organ. This instrument exists solely for broadcasting purposes, and was designed in every detail with this end in view.

On September 10th, during a broadcast intended to demonstrate the various features of this organ, the softest stop and the full power of the instrument were shown in contrast—at least, this is what was intended. The desired effect was, however, frustrated by the control engineer, who, having increased the power of the softest stop so that the listener had no idea of its relative softness, had to "cut down" the volume of the full organ to a much lower level—a fraction of a second too late, however.

This kind of thing naturally is most annoying to listeners, and it is time something was done to check such unwarrantable interference with the effects aimed at by broadcast performers.

VERNON C. COOMBS.

Bromley, Kent.

Alternatives to the Disc Record

I HAVE followed this correspondence with great interest, and I am surprised at the very unsatisfactory reply of the Gramophone Company, Ltd., to Flight-Lieut. Patrick King's letter.

To take the points in order:—

(1) I fear that the Gramophone Company has not read *The Wireless World* very carefull, otherwise such an article as "Synthetic Sound"—issue of February 3rd, 1933—would undoubtedly have given a very broad hint. Upon what scientific grounds is a paper "film" impracticable?

(2) The cost of printing paper "films" must be negligible compared with the cost of pressing records.

(3) Is it not a fact that the day of the *cheap* acoustic gramophone has now passed for ever, especially having regard to the comparatively cheap and efficient electrical reproducer?

(4) Why should Flight-Lieut. King, or, indeed, anyone else, go to the expense of purchasing a two turntable unit when a better reproducer *could* be made commercially by the use of "film"?

(5) I agree that the Gramophone Company have done very much indeed in furthering the cause of good music, but will the Company give unequivocal answers to Flight-Lieut. King's questions, viz.:—

(a) Why have not the gramophone companies produced an instrument on the lines suggested?

And

(b) Are the gramophone companies afraid that they are going to lose money on scrapping the existing equipment?

I think the answers would be interesting.

London, S.E.23. J. L. CARDEN.

CLUB NEWS

D.F. at Sea

Actual experiences of direction finding at sea were related by Mr. Rapsey in his lecture on direction and position finding by the Bellini-Tosi system, at a meeting of the Southall Radio Society. Hon. Secretary: Mr. A. J. Stephens, 98, Pole Hill Road, Hillingdon.

Straight Set Wins

Two to one in favour of the straight set was the outcome of the voting after a hard-hitting debate on "Superhet *v.* Straight Set" at a recent meeting of Slade Radio (Birmingham). The annual general meeting is to be held on November 30th, 8 p.m., at the Parochial Hall, Broomfield Road, Erdington. Hon. Secretary: 110, Hillaries Road, Gravelly Hill, Birmingham

Improving Quality

A demonstration of "Correcting Bass Response in Gramophone Reproduction" will be given by Mr. A. H. Pratt at the meeting of the Exeter and District Wireless Society, at 8 p.m., on Monday next, November 27th. Hon. Secretary: Mr. W. J. Ching, 9, Sivell Place, Heavitree.

The Acid Test

Fourteen loud speakers were put on trial at this season's first joint meeting of the Croydon and Thornton Heath Radio Societies. A home-made valve oscillator giving frequencies between approximately 75 to 6,000 cycles was used to discover bad resonances. On Tuesday next, November 28th, the Croydon Society will hold its short-wave night. Hon. Secretary: Mr. E. L. Cumbers, 14, Campden Road, South Croydon.

Demonstrating Exponential Horns

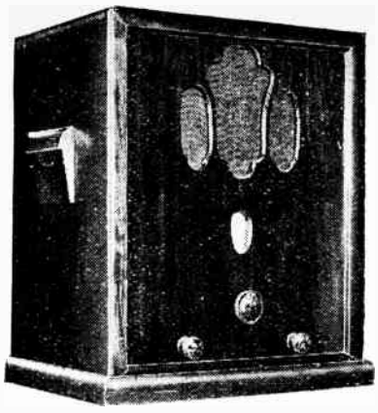
"Exponential Horn Loud Speakers and Quality" is the title of a lecture to be given by Mr. E. Mewse, M.Sc., at the meeting on Monday next, November 27th, of the Newcastle-upon-Tyne Radio Society, in the Church Hall, Armstrong Bridge, Jesmond. Hon. Secretary: Mr. W. W. Pope, 9, Kimberley Gardens, Jesmond.

Bargains!

The Edinburgh and District Radio Society will hold an auction sale on Thursday next, November 30th. Full particulars are obtainable from the Hon. Secretary, Mr. W. Winkler, 13, Lockharton Crescent, Edinburgh.

Ratepayers' Radio

The theory of the detector valve and of transformers will be dealt with by the New Eltham Ratepayers' Association, Radio Section, on November 30th. Meetings are held on alternate Thursdays at 8 p.m., at the Bungalow in the grounds of The Beehive Hotel, Footscray Road, Eltham. Hon. Secretary: Mr. A. E. Gillborn, 87, Montbelle Road, New Eltham, S.E.9.



The Faraday All-wave Superheterodyne S. 620L

Incorporating A.V.C.

FEATURES. ***Type.***—*Table model superheterodyne receiver for A.C. mains, covering wavelengths from 15-2,000 metres. Includes automatic volume control and a moving-coil loud speaker.* ***Circuit.***—*Var.-mu H.F. pentode signal frequency amplifier—H.F. pentode frequency changer—var.-mu H.F. pentode I.F. stage—duo-diode pentode second detector—pentode output valve.* ***Controls.***—*(1) Tuning calibration on all four wave-ranges. (2) Wave-range switch. (3) Volume and on-off switch. (4) Tone control switch.* ***Price.***—*In walnut cabinet, £28 10s.* ***Makers.***—*Faraday All-wave Wireless, 1, Salcott Road, London, S.W.11.*

EXTERNALLY the chassis is very little different in appearance from last year's model, which was reviewed in our issue dated October 28th, 1932, but several alterations have been made in the circuit which have resulted in improved performance.

Full advantage has been taken of the latest types of valves, and a duo-diode pentode has been employed in the second detector stage to give automatic volume control, which is of the greatest possible value when receiving short-wave stations which are subject to fading. Variable-mu H.F. pentodes are used in the H.F. and I.F. stages, which are both controlled on the medium- and long-wave bands. On short waves the signal frequency H.F. stage is running at full magnification, and the control is confined to the I.F. amplifier.

The frequency changer circuit is interesting. The valve used is an ordinary H.F. pentode, and the cathode, working grid and screen grid are used as the three electrodes of a modified Hartley oscillator. The anode is given a slightly higher potential than the screen grid, and the coupling to the I.F. circuit is made *via* the electron stream from screen grid to anode. This gives a very stable and efficient circuit, which is admirably suited to short-wave conditions.

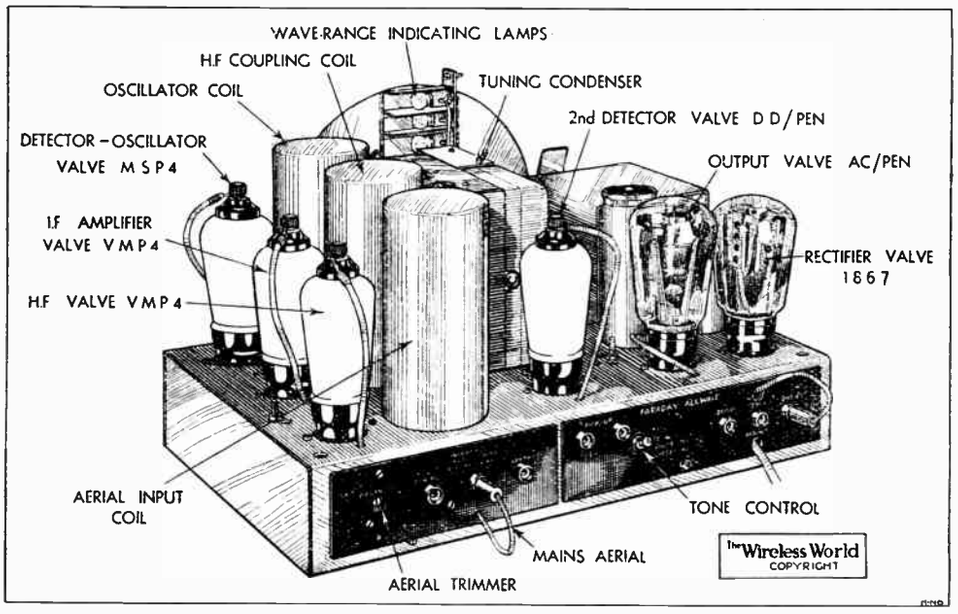
On medium and long waves the anode circuit of the signal frequency amplifier stage is tuned to the incoming signal, the coupling to the oscillator circuit being effected by resistances common to both circuits. On short waves, however, the anode is connected directly to the oscillator circuit. An aerial trimmer is provided, and the necessary adjustment is facilitated by connecting a voltmeter across the resistance providing the minimum bias for the variable-mu H.F. and I.F. valves. The second detector and A.V.C. circuits follow accepted practice, and a measure of tone control is introduced at this point by switching a small fixed condenser across the load resistance.

The performance on short waves naturally received first attention, and it is safe to say that the sensitivity and overall magnification would impress the most experienced short-wave enthusiast. At the time of our tests the 15-30 metre band gave best results, and Pittsburgh, W8XK, and Bound Brook, W3XAL, were well received in daylight during the afternoon. Although the receiver was installed in Central London near a busy thoroughfare and a certain amount of interference from car ignition systems was experienced, the signal strength from Bound Brook was sufficient to actuate the automatic volume control, so that the background noise was reduced to a negligible level except during one or two intervals of severe fading. The manual volume control could not be increased to beyond the mid-position without overloading.

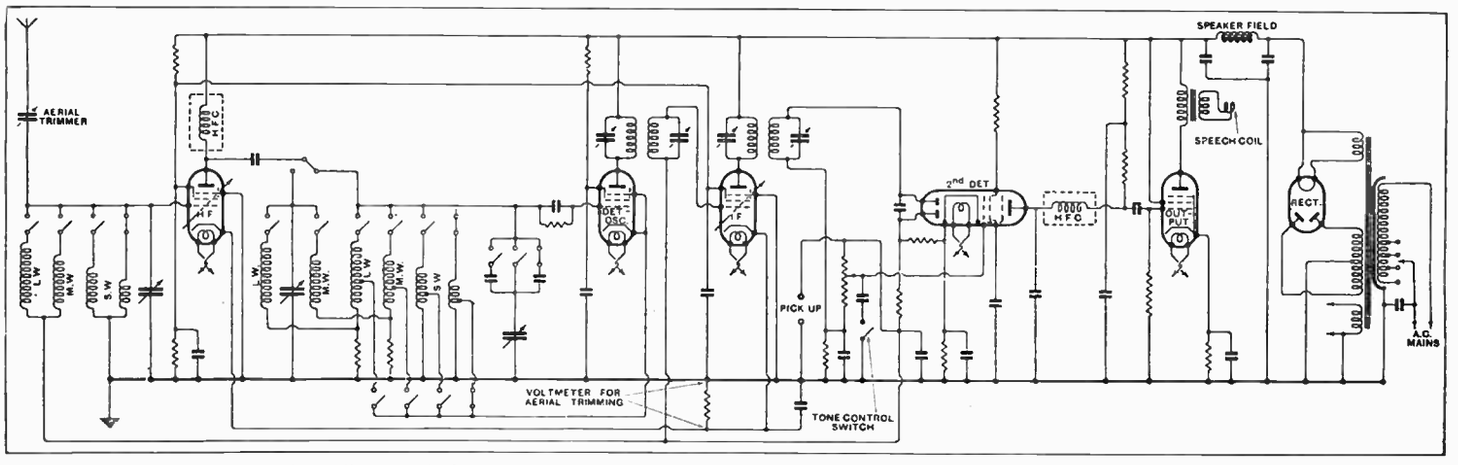
Although tuning is of necessity sharp on the short-wave stations, the stability of the circuit, even on an indifferent earth system, is above criticism, while accurate calibration on the short wavelengths is a feature which is all too rare in sets of this type.

Having successfully solved the problems presented by the short wavelengths, it is only to be expected that the designers would provide a good medium and long wave performance. Twenty-three stations were, in fact, logged on the medium wave-band in daylight, and the selectivity was sufficient to give adjacent channel separation on all stations with the exception of the local transmitters, where one channel on either side was lost.

A very full instruction booklet, containing useful information on short-wave conditions in general, and a wiring blue print is issued with each set.



Although radical changes have been made in the design of the circuit, the appearance of the chassis differs little from last year's model.



Complete circuit diagram. An H.F. pentode frequency changer and a duo-diode pentode second detector are features of the circuit in its latest form.

READERS' PROBLEMS

THESE columns are reserved for the publication of matter of general interest arising out of problems submitted by our readers. Readers requiring an individual reply to their technical questions by post are referred to "The Wireless World" Information Bureau, of which brief particulars, with the fee charged, are to be found at the foot of this page.

Grid Return Leads

THE fitting of A.V.C. to existing receivers (especially to those of the superheterodyne type) becomes easier and easier, but it would seem that many constructors are still uncertain as to the precise nature of the slight alteration that must be made in the grid circuit of the controlled valve (or valves).

These difficulties will generally disappear if it is realised clearly what we have to do. Put as simply and briefly as possible, the grid return leads of the controlled valves must be disconnected from the original source of fixed or manually-regulated bias, and then reconnected to the source of A.V.C. voltage in order that the operating bias may be varied automatically in sympathy with the strength of incoming carrier waves. In addition, decoupling will generally be needed.

With regard to the simplest type of mains-operated set, all that will have to be done in the way of disconnection is to take off the lead joining the low-potential end of the grid coil from the earth line or metal chassis. This point, which is marked X in Fig. 1 (a), is now joined to the source of A.V.C. voltage through a decoupling resistance, the associated by-pass condenser being added to "tie down" the circuit so far as H.F. impulses are concerned.

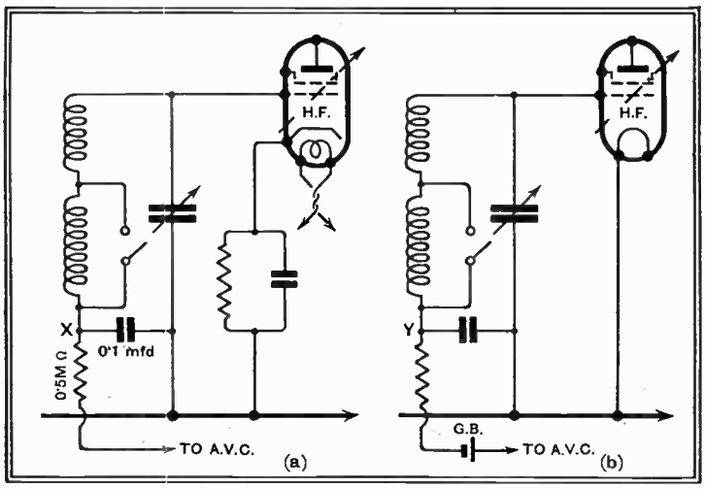


Fig. 1. When A.V.C. is added, slight alterations in the grid return circuits of "controlled" valves are usually needed.

In battery sets (Fig. 1 (b)) the procedure is basically the same. The low-potential end of the grid coil (marked Y in this diagram) was probably joined originally to earth through a bias cell, which should now be disconnected and then replaced on the other side of the decoupling resistance as shown.

Class "B" Pitfalls

IT has been proved that a properly designed Class "B" amplifier is capable of giving very pleasing quality; a good deal of space has lately been devoted in these pages to the eradication of the minor difficulties that are likely to prevent the attainment of good results.

A querist who has tried all the usual cures for distortion, but without success, now solicits our help: his circuit arrangement is correct, but he is using a driver transformer of unknown make.

Although this component *may* be satisfactory, it seems very likely that it is responsible for poor quality. It should be emphasised that the design of such transformers is by no means a simple matter, and that satisfactory specimens are only produced by firms who have devoted a good deal of thought to the subject.

Keep it Carefully

A CORRESPONDENT is using an eliminator rated to give 30 milliamps. at 150 volts. The H.F. and detector valves of his receiver consume between them 10 milliamps., leaving 20 milliamps. for the output valve.

What we are asked to do is to suggest a suitable 3-electrode battery-operated output valve which will absorb the available 20 milliamps.

We sincerely hope that our correspondent has not already mislaid the Valve Data Booklet included in our issue of November 3rd! A glance at that invaluable little publication will show that almost every manufacturer produces a 2-volt valve requiring between 18 and 20 milliamps.; there are so many excellent specimens that we can hardly draw invidious comparisons.

Where Losses are Unimportant

A QUERIST, who is not completely satisfied with the sensitivity of his newly built receiver, asks whether it is possible that efficiency could be improved by replacing the present reaction condenser, which has bakelite dielectric between the vanes, by one of the air-dielectric type.

As compared with air, it is certain that any solid dielectric material in common use is bound to introduce considerably higher losses. But in a reaction circuit it is most unlikely that these losses will have any prejudicial effect on sensitivity or selectivity. It is therefore suggested that, if self-oscillation can be brought about at all wavelengths, it is hardly worth while to make a change. Probably some other part of the receiver is susceptible to improvement.

Diode Potentiometer

IT is worth while pointing out that, with diode detection, there is no better method of obtaining post-detection volume control than by using a potentiometer (in place of a plain resistance) as the diode output load. Any desired proportion of the rectified voltage developed across this load may then be applied to the succeeding L.F. amplifier in the simplest possible manner, and without risk of introducing distortion.

These remarks are prompted by letters from two or three readers who have proposed unnecessarily complicated—and sometimes rather ineffective—methods of L.F. volume control in sets where diode rectification is employed. The same applies to receivers employing a Westector, which is in many ways comparable with a diode valve.

High-output Battery Amplifier

ALTHOUGH the undistorted output obtainable from the Class "B" system is enormous when judged by previous standards set for battery valves, it still falls short of that required in many instances for public address work. But by the use of two of the new valves in parallel it should be possible to obtain sufficient volume for many purposes without overtaxing the capabilities of a good high-capacity dry battery.

This subject is raised by a reader who asks for information on the "paralleling" of Class "B" valves. It seems probable that, even with a specially designed driver transformer, it would be extremely risky to connect merely the output valves in parallel in the obvious manner; apart from other difficulties, parasitic oscillation would probably occur. It is therefore recommended that both the driver and output valves should be duplicated; thus, two driver valves, two driver transformers, and two output valves, each feeding separate speakers, will be needed. The drivers will be connected as in Fig. 2, with their grids joined together. As the driver valve is a purely voltage-operated device and consumes no power, several may be "paralleled."

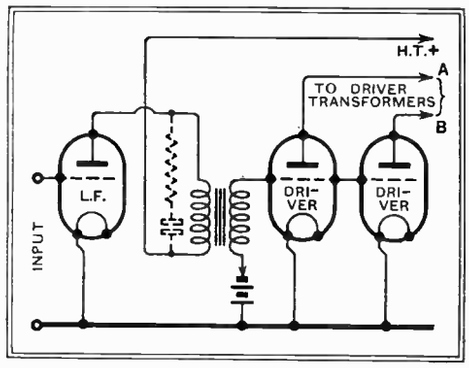


Fig. 2.—Duplicated Class "B" amplifier with exceptional power output. From points A and B onwards the separate output valve circuits are independent.

The Wireless World INFORMATION BUREAU

THE service is intended primarily for readers meeting with difficulties in the construction, adjustment, operation, or maintenance of wireless receivers described in *The Wireless World*, or those of commercial design which from time to time are reviewed in the pages of *The Wireless World*. Every endeavour will be made to deal with queries on all wireless matters, provided that they are of such a nature that they can be dealt with satisfactorily in a letter.

Communications should be addressed to *The Wireless World* Information Bureau, Dorset House, Stamford Street, London, S.E.1, and must be accompanied by a remittance of 5s. to cover the cost of the service. The enquirer's name and address should be written in block letters at the top of all communications.

HOW MANY LISTENERS REALISE?

17 Ratios for power or pentode: 4 for Class B give perfect matching. The Mansfield magnet gives greater sensitivity.

Extract from "Wireless World."

". . . . and a choice of seventeen ratios is available for single output valves and four ratios for push-pull stages requiring a centre tap. The change both in volume and quality, on varying the step-down ratio, is most marked, and the load can be rapidly adjusted to give the best results. Tested with the load adjusted to the calculated value, the efficiency was found to be exceptionally good for a permanent-magnet unit. Above 100 cycles it was equal to that of our standard 10 in. energised unit. The PM4A is also remarkable for the excellent response at the extreme top. Between 7,000 and 9,000 cycles it has a better output than any small commercial unit so far tested."

A user writes:

"I wonder how many listeners realise (as I did when trying out the 'Microlode' pointer) how much volume is wasted when the speaker is not correctly matched to the output valve."

'Microlode' Model PM4A **42/-** 'Microlode' Model PM6 **32/6**

Whiteley Electrical Radio Co. Ltd., Dept. W, Radio Works, Mansfield, Notts.

Sole Agents in Scotland: Radiovision Ltd., 233 St. Vincent St., Glasgow, C.2.

Sole Agents in I.F.S.: Kelly and Shiel, Ltd., 47 Fleet St., Dublin.

HAYNES QUALITY RECEIVER

RECOGNISED AS THE SET FOR THE CONNOISSEUR.

Embodying all the latest and best practice.

Band pass aerial coupling preceding H.F. stage using variable-mu pentode H.F. valve (seven-pin V.M.P.4). High voltage power grid detection with unique arrangement of grid voltage control giving particularly smooth reaction adjustment, three Ferrocart tuned circuits, two resistance-coupled L.F. stages, all resistances wire-wound. Generous mains equipment, optional single or dual loud speakers, high voltage 6-watt output stage, two unit construction, all components and pressed metal base plates finished blue-grey cellulose, the exclusive Haynes feature.

Only those components are used which are known to be the best.

KIT £21.0.0. ASSEMBLED CHASSIS £22.15.0. RADIO GRAMOPHONE £37.10.0

Complete with valves and loud speaker. Dual speakers 30/- extra.

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1 **POLAR** "Full-Vision" Semi-circular Drive Dial for above	5 9
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3 **BULGIN** H.F.9 Screened H.F. chokes	10 6
2 **DUBILIER** Electrolytic condensers, 8 mfds., 450 volts peak working	11 0
1 **DUBILIER** L.C.G. Terminal Type, 2 mfds., 550 volts, D.C. working in rectangular metal container	10 0
1 **DUBILIER** 9200 Fixed condenser, non-inductive, 2 mfds., 250 volts, D.C. working	3 6
2 **DUBILIER** 9200 Fixed condensers, non-inductive, 1 mfd., 250 volts, D.C. working	5 0
7 **DUBILIER** 9200 Fixed condensers, non-inductive, 0.1 mfd., 250 volts, D.C. working	14 0
5 **DUBILIER** .0001 mfd. Fixed condensers Type 665	2 6
2 **DUBILIER** .0005 mfd. Fixed Condensers, Type 665	1 6
1 **DUBILIER** .0005 mfd. Fixed condensers, Type 670	1 3
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1 **BULGIN** PR.10 Wire-wound resistance, 7,500 ohms, 20 watt	2 6
1 **ERIE** Resistance, 100 ohms, 1 watt	1 0
3 **ERIE** Resistances, (1) 500 and (2) 600 ohms	3 0
1 **ERIE** Resistance, 500 ohms, 3 watts	3 0
10 **ERIE** Resistances, (2) 1,000 ohms, (1) 2,000 ohms, (1) 5,000 ohms, (1) 15,000 ohms, (3) 20,000 ohms, (1) 30,000 ohms, (1) 500,000 ohms, 1 watt	10 0
1 **ERIE** Resistance, 1 megohm	1 0
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1 **MAGNUM** (Special) Tapered volume control, 250,000 ohms	5 0
1 **FERRANTI** AF5 L.F. Transformer, 1:3½	1 10 0
1 R.I. DY51 L.F. choke, 20 henrys, 60 mA.	13 6
4 **CLIX** Chassis Mounting Standard Model Valve holders, 5-pin	3 0
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1 **BULGIN** S.98 Double-pole change-over switch	2 3
1 **BULGIN** S.102 on-off toggle switch	1 3
1 **BULGIN** S.80 on-off toggle switch	1 6
2 **BULGIN** K.14 Knobs	0 9
1 **WILBURN** 5-way connector	2 6
1 **HARBROS** 5-way battery cable, with twin 70/36 leads	2 3
2 **BULGIN** P.3 5-pin plugs	6 0
4 **BELLING-LEE** "B" Ebonite shrouded terminals, A., E., pick-up (2)	2 0
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KIT A. Cash or C.O.D. Carriage Paid	£12 15 6

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	£ s. d
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1 **SAVAGE** "Massicore" RC27M L.F. smoothing choke	1 8 0
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R.

SELECTED Parts for Sale, as new; c.o.d. or "Wireless World" deposit system, which we recommend if in doubt as to the splendid value offered; we take risk of damage in transit to our customers; goods tested for callers and guaranteed.

FERRANTI MI, Speaker P.M., without transformer, £3/12/6; pair Earl dual speakers, 200v. D.C., on baffle, 35/-; Maconi pick-up and universal motor, complete unit, 30/-; Epoch 20c speaker, new, 27/6; R.I. O.P.P. input transformer and choke, second-hand, 19/-; Radiophone Radiopack, new, straight type with volume, 45/-; Varley impedance, matching transformer, for high resistance speakers, 7/6.

RADIOPHONE Disc Drives, new, with large silver O.X.Y. escutcheon plate complete, fit ⅜in. spindle, read 0-100 from left to right; 5/6, post free.

J.B. 3-gang, with drive R3, 10/6; H.M.V. No. 7 pick-up with transformer, 10/6; Limit senior P.U., 15/-; Limit reliance, 7/6; Heayberd 50H 150 m.a. choke, 9/6; Heayberd 4v. 3 amp. L.T. transformers, 200/250v., 6/-; Varley Nicore 2 chokes, 5/6; Telsen 15H 40 m.a. chokes, 4/-.

METERS.—Ferranti 0-10 amp., flush, 15/6; 0-15 m.a. flush, as new, 22/6; Weston type, 506 flush, 0-10 m.a., 20/-; Weston 0-300 m.a., flush type, 301, 21/6; Sifam 0-30 m.a., flush, 15/6; Heayberd baseboard, 0-200 m.a., 12 6; Everett projecting 0-240v. A.C., with resistance box, meter takes 15 m.a., 20/-.

RADIOPHONE Pots, with switch, 8,000, 10,000, 11,500 ohms, 2/6; without switch, 5,000, 100,000 ohms, 2/-.

SPECIAL Offer of 3v. and Rectifier (valve) Chassis, from Yagerphone, all guaranteed, new, and very well made, chassis only 50/-, with valves 90/-, carriage forward.

RYALL'S RADIO Offer Reliable Resistances, suitable for all sets where a 1-watt resistance is specified, in values 100, 250, 500, 1,000, 2,000, 5,000, 10,000, 15,000, 20,000, 25,000, 30,000, 40,000, 50,000, 75,000, 100,000, 150,000, 250,000, ½-meg., 2-meg., all values stated in ohms, 6d. each; also 2-3-watt type, 1,000, 10,000, 9d.; also in 1½-watt type; values available for "W.W." sets, 7d. each.

NEW Output Transformers Similar to R. and A., ratio 18/23 32, 5/-; Telsen 0.05 mica condensers, 2/3; T.C.C. 0.01 mica type M., 1/-; new Paxolin formers, 1in., slotted, with guiders, 8d.; T.C.C. 2 mf., 350v. working, 1 6; T.C.C. 4×4 mf., 4/-; H.M.V. 4×4, 3/6; T.C.C. 4·4·1×1½ mf., 4 9; H.M.V. ditto, 4/-; Ryall's 0.1 Tubular non-inductive wire ends.

EDISON BELL 10,000 Eureka, wire wound, with holders, 1/-; Edison Bell 0.0005 universal log all metal condensers, 1 6, new.

SPECIAL Offer of Pye 20h. Chokes, 40 m.a., 130 m.a., maximum D.C. resistance 300 ohms, in brown crystaline finish, new, unused, Pye 32h. chokes, D.C. resistance 750 ohms, 30 m.a., 80 m.a. maximum, ditto, 6/3 each, post free.

RYALL'S RADIO, 33, Chancery Lane, London, W.C.2 (nearest Tube Chancery Lane; 'bus 67 passes door, or tram to Savoy St.). Holborn 3529. Open Saturday afternoon. Close 7 p.m., Thursdays 1 o'clock, Saturday 6 p.m.

R. [4047

PREMIER.

PREMIER SUPPLY STORES Offer the following Set Manufacturers' Surplus New Goods at a fraction of the Original Cost, all goods guaranteed perfect, carriage paid over 5/-, under 5/- postage 6d. extra (Ireland, carriage forward).

ELIMINATOR Kits, including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v. 20 m.a., 20/-; trickle charger 8/- extra; 150v. 30 milliamps, with 4v. 2·4 amps C.T., L.T., 25/-; trickle charger, 6/6 extra; 250v. 60 milliamps, with 4v. 3-5 amps, C.T., L.T., 30/-; 200v. 100 milliamps, with 4v. 3-5 amps. C.T., L.T., 49/6; 300v. 60 milliamps, with 4v. 3-5 amps. C.T., L.T., 37/6.

(This advertisement continued on next page.)

Even a child can appreciate Hartley-Turner Reproduction

The following extract from a Headmaster customer's letter is interesting:

"I want to say how much we like the speaker. It is much preferable, infinitely so, to the one we were using. I took a test with a class of 24 children on speech, first yours and then the ——; then yours again, followed by the ——, and told them to listen carefully to both. Twenty-two out of the 24 were positive in their opinion that they could hear more easily when yours was in circuit. A good result but, of course, a foregone conclusion."

The other loudspeaker sells at about the same price as our own

D.C. Model - - 7 Gns.
A.C. Model - - 8 Gns.

In collaboration with Purley Radio, Ltd., 18, Tudor Court, Purley, we are giving a demonstration of Hartley-Turner Reproduction at the Queen's Hall, South Croydon, on November 29th, from 8.30 p.m. to 12 midnigbt Come and hear something you have never heard before!!

HARTLEY-TURNER RADIO LTD.
Thornbury Road, Isleworth, Middlesex
'Phone: Hounslow 1854.

GENUINE
REISZ MICROPHONES
can be obtained from us. The real marble-block B.B.C. Marconi-Reisz.

A No. 11 Home Recorder Mike at 5/6

will give you good results and a large amount of pleasure when used with your radio set. A Reisz microphone needs ample and good quality amplification beyond the power of most users, but our microphones are designed for the every-day user. We are makers and carry the biggest and most varied stock in London; 25 Types to choose from.

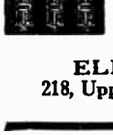
Pedestal Mike for Recording or P.A. **18 6**

EILSEL P.A. Mike (as advertised) 70/- with stand

Home Recorder MikeNo.11 **5 6**

Our famous **Button Insets** for detectaphone experiments are only **1/-**. L.R. Volume controls, **6d.** For making your own Mike, Carbon Granules in glass capsule, Grade 1, **8d.**; No. 2, **1/-**; No. 3, fine, **1/6**; No. 4, extra fine, **2/-**. Back Blocks, **3d.** Diaphragms, **4d.** Button, with 2in. mica diaph., **1/6.** Mounted on pedestal, **2/6.** Hand Mikes in 2in. case, No. 11 at **5 6**; Superior Type, No. 11B, **7/6.** Fay Mikes, factory throwouts, **8/-.** Lesdix No. 10B Pedestal, 10in. high, **12 6.** Lesdix Superior No. 12BB Ring, 14in. Pedestal, **18 6.** W.E. Type Table Model, 5in. dia., for lectures, **35/-.** Genuine first class Studio Recording Mikes, as new, ex a talkie studio, Edison Bell, Goodson Grams, etc., B.T.H. Moving Coil P.M. **£5**; Amplion, **£5**; Browns D, **£12**; Voight Electrostatic, **£10**; Igranic Transverse, **£13 10/-**; Western Electric P.A., **£14**; Siemens H. Ribbon, £50 Moving Coil for **£20**; famous Marconi-Reisz B.B.C. Model, **£25.**

LESDIX SERVICE CHARGERS A.C.—D.C.



We have 25 models to offer and our prices are low for special requirements. Three popular sizes are the AC109A for 36 cells, the AC106 for 108 cells, and the Lesdix Super Six for 200 cells.
Write for "CHARGER" LEAFLET "W."

ELECTRADIX RADIOS,
218, Upper Thames Street, London, E.C.4.
Telephone City 0191

Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)

T.C.C. Condensers, 750v. working, 2 mf., 3/6; 4 mf. 6/-. 4 mf. 450v. working 4/-, 250v. working 1 mf. 1/3, 2 mf. 1/9, 4 mf. 2/6, 1,500v. working Standoff insulators 0.5 mf. 1/6, 2 mfd. 6/-, aqueous electrolytic 440v. working, 4 mf. 3/-, 8 mf. 5/6.

ALL the Following Lines 6d. each or 5/- per dozen; 4- and 5-pin chassis mounting valve holders; shielded screen grid or pentode leads 1-watt wire end resistances, any value; 0.1 condensers; on-off switches push-pull; polar ganging devices; 0.02 condensers, 0.5 condensers, 0.01 condensers, 0.2 condensers.

POLAR 3-gang 0.0005 Condensers, split end vanes, totally screened disc drive: 6/11.

AMSCO Triple-gang 0.0005 Condensers, with trimmers, 4/11.

T.C.C. Electrolytic Condensers, 100 volts working, 15 mfd.; 1/3

PREMIER Chokes, 40 m.a., 25 hys., 4/-; 65 m.a., 30 hys., 6/-; 150 m.a., 30 hys., 10/6.

PYE Chokes, 20 or 32 hys., 4/-; Premier multi-ratio output transformers, giving 15 different ratios, 7/6.

HIGH Inductance Chokes, resistance 2,500 ohms, 80 henrys, 6v m.a.; 5/6.

WESTINGHOUSE Metal Rectifiers: 120v. at 20 m.a., 6/6; 180v. at 30 m.a., 8/6.

HARLEY Pick-up, complete with arm and volume control; 12/6

BRITISH RADIOPHONE Wire Wound Potentiometers, with mains switch incorporated, 5,000 ohms, 10,000 ohms, 50,000 ohms, 100,000 ohms, any value; 3/6.

KOLSTER BRANDES Gramophone Motors, dual type, can be worked by clockwork or mains, induction type 100-250 volts, 27/6, complete with all fittings and turntable.

MAGNAVOX D.C.144, 2,500 ohms, 17/6; Magnavox D.C.142, 1,000 ohms, 21/-; all complete with Humbucking coils; please state whether power or pentode transformer required; A.C. conversion kit for either type, 10/-.

SPECIAL Offer.—Microphones by prominent manufacturer, high sensitivity, uniform response, complete with stand, transformer and battery; listed £3/15, our price 18/6.

PREMIER British Made Meters, moving iron, flush mounting, accurate; 0-15, 0-50, 0-100, 0-250 milliamps., 0-1, 0-5 amps., all at 6/-.

ORMOND Condensers, 2-gang, semi shielded, 2/6; wire wound potentiometers, 15,000 ohms, 1/6.

SPECIAL Offer of Mains Transformers, manufactured by Philips, input 100-115v. or 200-250v., output 180-0-180 volts, 40 m.a., 4v. 1a., and 4v. 3a., 4/6; 200-0-200v., 4v. 1a., 4v. 3a., 4/6.

ALL Premier Guaranteed Mains Transformers have engraved terminal strips with terminal connections, input 20 250 volts, 40-100 cycles, all windings paper interleaved.

PREMIER H.T.8 Transformers, 250v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 25/-.

PREMIER H.T.9 Transformer, 300v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectified, 26/-.

PREMIER H.T.10 Transformer, 200v. 100 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.

DOUBLE Spring Motors, made by Garrard, play five sides of 10in. record, complete with turntable and all fittings, 17/6.

McMICHAEL 2-screen Grid Pentode Transportable 4, complete; gets many stations; £3; no valves or batteries.

SPECIAL Offer.—Accumulator chargers, input 200 250v. A.C. to charge 2- and 4-volt accumulators at ½ amp.; owing to the high efficiency of the silver oxide rectifier employed charger may be used during broadcast; 9/6 each.

CENTRALAB Potentiometers: 50,000, 250,000 and 500,000 ohms, 2/- each; ditto, wire wound, 200 ohms and 400 ohms, 1/-.

A FEW More Only.—Western Electric 4211E's and 4211D's, 15/-; 4212's, £3; callers only.

WESTERN ELECTRIC Mains Transformers: 500-0-500v. 150 m.a., 4v. 3-5 amps., 4v. 2.5 amps., 4v. 2.3 amps., 4v. 1 amp., C.T., 4v. 1 amp., C.T.; 19/6.

RELIABLE Canned Coils with circuit; accurately matched; dual range; 3/- per coil.

PREMIER L.T. Supply Units, consisting of Premier transformer and Westinghouse rectifier, inputs 200-250 A.C. output, 8v. ½ amp., 13/6; 8v. 1 amp., 17/6, 15v. 1 amp., 19/-; 6v. 2 amps., 27/6; 30v. 1a., 37/6.

PREMIER Mains Transformer, output 135v. 30 m.a., for voltage doubling, 8/6; 4v. 3-4a., c.t., L.T., 2/- extra; Westinghouse rectifier for above, giving 130v. 30 m.a., 8/6.

PREMIER Mains Transformers, output 250-0-250 volts 90 m.a., 4v. 3 5a., 4v. 2-3a. (both c.t.), with screened primary, 15/-.

PREMIER Mains Transformers, output 350-0-350 volts, 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary; 15/-.

PREMIER Mains Transformers, output 400-0-400 volts, 100 m.a., 4v. 4-5a., 4v. 2-3a., with screened primary; 15/-.

PREMIER Auto Transformers, 100-110/200-250 volts or vice versa, 50-watt, 7/9; 100-watt, 10/-.

SPECIAL Offer of Manufacturers' Type Transformers, any input, output 250-0-250 volts, 60 m.a., 4v. 1a., 4v. 3a. (both c.t.), 8/6; H.T.8 transformer, with 4v. 3-4a. (c.t.), 8/6; with rectifier, 18/6.

FILAMENT Transformers, polished and engraved terminal boards, N.P. terminals, 4v. 3-4a., 5/-; 10v. 3a., 6/6; 12v. 1a., 5/-; 4v. 4-6a., 6/6; 14v. 4a., 6/6; 22v. 1a., 6/-; 6v. 2a., 5/-; 9v. 1a., 5/-.

(This advertisement continued on next page.)

THE LATEST and most important development in CLASS 'B' Mains Unit design.

Our new Automatic Voltage Regulator has enabled us to produce a new Class 'B' Mains Unit giving an almost unvarying voltage output up to 55 mA., and maintaining the economies of Class 'B.' This high quality Unit is exceptionally compact and pleasing in appearance. The only Unit on the market completely suitable for Class 'B.' Write for regulation curve and further details.

MODEL B.A. 55 for A.C. 88/6d.
THE BRITISH MAINS UNIT COMPANY
Cromwell House, High Holborn, London, W.C.1.

TWO ESSENTIALS

To you, the acquisition of the "New Monodial" is essential to your complete peace of mind. To us it is essential that we keep up our stocks of second-hand goods. We have the "Monodial" Kits. Have *you* any surplus? Let us know what you have for disposal. As we actually have a market for *any* second-hand radio goods we can make you a *genuine* offer. *Further, our alternative Component Power Unit Kit (guaranteed and incorporating Ferranti A.F.5.C.) at £6: 15/- also helps considerably to bring down costs without in any way affecting performance. Drop us a note to-day.*

MACINDOE & CO.,
99, WATERLOO ST., GLASGOW.

Micromesh TRADE MARK
THE MODERN VALVE
Literature and prices on request.
Standard Telephones & Cables Ltd., St. Chad's Place, 264, Gray's Inn Rd. London, W.C.1

The BRITISH RADIO INSTITUTION

Founded 1930—world-wide membership, steadily increasing. Objectives—Technical co-operation between members and the advancement of radio science. Associateship by examination or approved qualifications. Examinations in London and Edinburgh 13th Jan. 1934. Closing date for entries 16th Dec. Balance Sheet published annually. Explanatory brochure (free) from Hon. Sec. Administrative Offices—**36, GORDON SQUARE, LONDON, W.C.1.**

The British Radio Annual **2/-** *net (free to members).*

FEL-ECTRIC A.C. ELIMINATORS

From **39 6** 120 v. 12m a.
UNEQUALLED — **PRICE QUALITY SATISFACTION**
"Class B" Amplifier Unit 28/-.

ASK YOUR DEALER.

FEL-ECTRIC RADIO, Garden St., SHEFFIELD. 'Phone: Sheffield 20795

Foremost as Pioneers

Varley

Proprietors: OLIVER PELL CONTROL LTD.

TRANSFORMER AND CHOKE STAMPINGS, INSTRUMENT AND RESISTANCE WIRES.

Lists Free

LUMEN ELECTRIC CO.
9, SCARISBRICK AVE., LITHERLAND, LIVERPOOL, 21

YOUR H.F. ANODE REQUIRES
THE BEST H.F. CHOKE; USE TYPE I.D.C.,
Iron-dust Cored, with the exceptionally low self-capacity of 3 m.mfds. and with an adequate impedance for all Variable MU, and H.F. Pentode Valves - **4/6**

KINVA TRADE MARK

Admirable for Diode Circuits.

POSTLETHWAITE BROS., KINVER, Nr. Stourbridge.

Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)

PREMIER Eliminators, input 200-250 volts, 40-100 cycles, A.C., incorporating Westinghouse metal rectifiers, output 250v. 60 m.a., S.G. and 120v. taps, 42/6; with 4v. 4a., c.t. L.T., 7/6 extra.

PREMIER Eliminators, output 150v. at 30 m.a., S.G., and 100 taps, with 4v. 3-4a. c.t. L.T., 37/6; or with trickle charger, 42/6.

PREMIER Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps, 27/6; with L.T. trickle charger incorporated, 35/-.

MAGNAVOX P.M. Loud-speakers, 7in. cone, 18/6; please state whether power or pentode transformer required.

CRAMPION P.M. Loud-speakers, 9in. cone, handles 4 watts; 18/6.

CRAMPION M.C. Loud-speakers, 2,500 ohm field, 9in. cone, handles 6 watts; 21/-.

H.M.V. Condenser Blocks, 4×4×1×1×0.5, 250v. working, 3/6; ditto, 400v. working, 5/6.

ELLIOT First-grade Moving Coil Meters, 0-30, 0-50, 0-100, 0-150 milliamps, projecting types, 15/- each; 0-100, 0-150 milliamps, flush types, 17/6 each.

PREMIER D.C. Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps; 15/-.

ACCUMULATOR Chargers, 200-250 volts A.C., all incorporating Westinghouse metal rectifiers, 2, 4, and 6v. at 1 amp., 17/6; 12v. 1a., 27/6; 6v. 2a., 35/-; 30v. 1a., 42/6; 50v. 1a., 62/6.

B.T.H. Induction Type (A.C. only) Electric Gramophone Motors, 100-250v.; 30/- complete.

AMPLION Moving Coil Speakers, type E.M.644, dual fields 2,500 and 5,000 ohms (100 and 200r.), with output transformer, 12/6; A.C. conversion kit for this speaker, 10/- extra.

WESTERN ELECTRIC Condensers, 250v. working, 1 mfd. 6d., 2 mfd. 1/-; 500v. working, 1 mfd 1/-.

T.C.C. Condensers, 250v. working, 4×4×1 mfd., 3/6; 6×4×2×2×2 mfd., 375v. working, 6/11; 4×4×1, 6/-.

SPECIAL Offer of Wire Wound Resistances.—4 watts any value up to 10,000 ohms, 1/-; 8 watts, any value up to 15,000 ohms, 1/6; 15 watts, any value up to 1,000 ohms, 2/-; 25 watts, any value up to 50,000 ohms, 2/6; 50 watts, any value up to 50,000 ohms, 3/6.

PREMIER SUPPLY STORES, 20-22, High St., Clapham, S.W.4. Macaulay 2188. Closed 1 o'clock Wednesdays, open to 9 o'clock Saturdays. Nearest Station, Clapham North Underground.

PREMIER. [4089

WOBURN RADIO Offer Following New and Bankrupt Stock:—

FERRANTI Multi Radio Output Transformers, 32-1, 23-1, 18-1, 4/11; Class B driver and choke, 9/6 per pair, with suitable valve and 7-pin holder, 22/-; S.T.500 coils, per pair, 5/6; Wego 750v. test condensers, 1 mfd. 1/-, 2 mfd. 1/3, 4 mfd. 2/4, 0.1 mfd. 250 working 1/-; Siemens 0.01×0.01 mfd., 0.1×0.1 mfd., 3,500v. test, 1/7; Amplion 0.0005 mica tuning condensers, 9d.; Graham Farish 0.0003 and 0.0002 ditto, 9d.; Philips 1 watt wire wound resistances, 10,000, 30,000, and 2,000, 2/3 half dozen; Clix 4- and 5-pin valve holders, 1/3 half dozen; Erie ½-watt 100, 300, 450, 5,000, 20,000, 25,000, 50,000, 100,000, and 1 meg., 4/6 dozen; 1 watt 350, 25,000, 40,000, 6/6 dozen; binocular chokes, 1/3; H.F. chokes, 10d.; Centralab volume controls, with switch, 20,000, 2/-; all types of valves in stock; let us quote for parts; also A.V.C. 3 and Monodial kits.—Woburn Radio Co., 7, Woburn Buildings, W.C.1. Euston 1571 (near Euston Station, back of St. Pancras Church). [4061

MILDMAY RADIO EXCHANGE Offers the Following, sound and perfect:—

RADIOPHONE 3-gang Super Condensers, fully screened, 14/-; Ormond 2-gang ditto, 8/6; single gang ditto, 4/9; Multitone Toco 6-1, 9/6; Lewcos L.F.T.6 transformers, 7/-; Varley Nicore 1, 9/-; R.I. Varitone, second-hand, 6/-; Parmeko Intervalve Transformer, heavy duty type, 17/-; Parmeko L.F. Choke, 30h. 50 m.a., 15/-; Lewcos Band Pass Filters, 6/6; Lewcos Oscillator Coils to match, 5/-; Lewcos and Wearite Superhet Coils, 4/6 each.

FERROCART F1, F2, F3 Coils, second-hand, 25/-; Varley BP30 and BP31, 10/- pair; Tunewell S20 25 L.F. Chokes, 6/-; Radiophone 4-gang Condenser, fully screened, 15/-; Varley Push-Pull Input Transformer, 14/-; Colverdynes, 6/- each; Set Colvern, K63, KGR, KGC, 17/6; Ganged Polar Star, 3-gang, 12/6; Colvern Super Net Coils, 14/- set, 3-gang.

FERRANTI Chokes, B1, 10/-; B2, 12/-; B3, 7/6; B5, 15/-; Transformers, AF3, 11/-; AF4, 8/-; AF5, 16/-; AF6, 17/-; OPM1, 10/-; OPM1c, 14/-; OPM2c, 12/-; OPM3c, 12/-; OPM6, 12/-; AF11c, 17/6; OPM13c, 12/-; B.T.H. 4-1 Transformers, 4/6; Varley L.T. Smoothing Chokes, 4/6 each.

MARCONIPHONE 1933 Type 330 A.C. Mains Radiogram, originally listed £30/9, circuit screen grid detector with pentode output, in solid oak cabinets, £13/13 each; only a few left.

HAMPTON 1932 Model Table Type Radiogram, A.C. mains, in walnut cabinet, circuit screen grid detector, with pentode output, Rola speaker, Garrard A.C. motor, Mazda valves, £10; complete.

ALL the Above Carriage.

PHONE: Clissold 5001.

OPEN Thursday, Closed Saturday All Day.

24, MILDMAY GROVE, London, N.1. [4053

TWO Ferranti A.F.3 Transformers; 25/- pair.—9, Hope St., Hazel Grove, Stockport. [4038

METERS Moving Coil, Weston 301; 10 m.a. and upwards, 22/6; Galvos 30-0-30, 27/6.

NEW British Made, 1 m.a., 27/6; 250 volts (1,000 w. per volt), 32/6; Turners 20 m.a. upwards, 17/6; thermo ammeters, 1.5a, 22/6; French 3-range, 3 m.a., 6v., 240v., 22/6, 2-range, 2 m.a., 240v., 20/-; German 2 m.a., 25/-; 2,000 volts, 32/6; assorted makers, 25 m.a. and upwards, 10/6; laboratory apparatus in stock; meter repairs a speciality.—The Victa Electrical Co., 47, High St., Battersea, S.W.11. 'Phone: Batt. 0780. [0355

EPOCH

Moving-Coil SPEAKERS

are Britain's Best. Therefore the best in the world.

PRESTIGE

Each model Epoch Speaker is the outcome of research and manufacturing experience much longer and more intensive than any other make in England.

QUALITY

Epoch Moving-Coil Speakers are renowned the world over for quality of reproduction. They are used everywhere where "Quality First" matters. They have never succumbed to the "Cheapness First" slogan. Epoch has put "Quality" into Moving-Coil Speakers 7 years ago and has led by "Quality" ever since.

PRICE

Each model of Epoch Speaker represents much greater value for money than other makes. Epoch uses permanent magnets of 9 per cent. to 35 per cent. Cobalt Steel, the most efficient, costly and most magnetically durable: most other makes employ relatively cheap chrome or tungsten steel, or low content cobalt steel. Everything else is equally of the best, including innovations not obtainable in any other speakers.

RANGE OF MODELS

Epoch make the most extensive and comprehensive range of Moving-Coil Speakers in the world. The range includes:

- **Models from 5in. to 28in. diaphragms.**
- **P.M. models from 23/6 to £8 8s.**
- **Dual matched and individually hand-made models.**
- **Energised and P.M. models for the smallest sets.**
- **Energised and P.M. models for the largest halls and Public Address systems.**
- **P.M. models for Public Relays.**
- **Class B models specially made to give the highest efficiency with Class B.**
- **Models weighing 1 lb.**
- **Models weighing 300 lbs.**
- **Many models in handsome cabinets for use as additional speakers.**

MOVING COIL SPECIALISTS

Moving-Coil Speakers. Moving-Coil Microphones. Moving-Coil Headphones. Output Transformers for M.C. Speakers. Mains Units. Class B Combinations. Class B Adaptors, Transformers and Chokes. Cabinets for speakers. Horns and Flares, etc.

ADVERTISING

Epoch does not need to advertise extensively, since each one of the many thousands of Epoch users proclaim Epoch virtues, far and wide. Nearly 2,000 unsolicited written testimonials are on view at Exmouth House.

Write for Folder of New Season's Programme, call for a demonstration, or let us have your Moving-Coil problems.

EPOCH RADIO MANUFACTURING Co., Ltd.,
EXMOUTH HOUSE, EXMOUTH ST., LONDON, E.C.1.

Components, etc., for Sale.—Contd.

SOUTHERN RADIO'S Wireless Bargains.—Set manufacturers' guaranteed surplus.

MAINS Transformers.—250-0-250 volts 60 m.a., 4v. 1a., 4v. 2-4a., 11/-; 250-0-250 volts 60 m.a., 4v. 1a., 4v. 2-3a., 4v. 1a., 12/-; 350-0-350 volts 60 m.a., 4v. 2-2½a., 4v. 2-4a., 13/6; 350-0-350 volts 120 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 1a., 16/-; 500-0-500 100 m.a., 4v. 2½a., 4v 3-5a., 4v. 2a., 19/-; step-up or step-down transformers, 0, 100, 110, 200, 230 and 250 volts, 60 watt output, 12/6; 100 watt output, 14/9.

SMOOTHING Chokes.—20 henrys, 120 m.a., 320 ohms, 8/9; 50 henrys, 60 m.a., 500 ohms, 7/8; 40 henrys, 40 m.a., 700 ohms, 6/6; Ferranti chokes, 20 henrys, 60 m.a., centre tapped, 6/9 (list 21/-).

ALL-MAINS Transformers and Chokes Guaranteed for 12 Months, specials quoted for and delivery given within 3 days of order.

VARIABLE Condensers.—Lotus 2-gang 0.0005, complete with dial, knob, escutcheon, 8/6; all ganged condensers are fully screened with trimmers, and boxed; Lotus Dyblock single variable condensers, 0.0005, complete with dial, escutcheon, etc., 4/9 (list 9/6); Hydra block condensers, new, 16 mfd., 2+2+8+2+1+1, 1,000 volt test, 7/- each; 4 mfd., 2/6; 2 mfd., 1/9; 1 mfd., 1/-; T.C.C. 4 mfd. electrolytic, 440 D.C. working, 3/- each; Hellesens 8 mfd. electrolytic, 3/9 each.

SPEAKERS.—Permanent magnet speakers, 7in. cone, 28/- (listed 49/6); D.C. mains energised, 2,500 to 6,500 ohms, complete with humbucking coils and transformers, 16/6 (list 39/6); 7 Magnavox moving coil D.C., 2,500 ohms, 18/- each (list 39/6); G.E.C. Stork speakers, complete in magnificent cabinet, 19/6 (listed £3/15); Ormond speakers, complete in cabinets, 10/- (listed 25/-); Blue Spot, 100U, 13/6 (list 37/6).

CONSTRUCTORS' Kits.—Ready Radio Meteor screen grid 3-valve kit, less valves, 26/-; with 3 Mullard valves (P.M.12a, P.M.2D.X., P.M.2a), 49/- (list £5/7/6); Universal Radio 3-valve kits, ready assembled on chassis, 12/6 (listed 45/-).

READY RADIO "303" A Kits, complete with cabinet, M.C. speaker, less valves, £2/5; with 3 Mullard valves (P.M.1L.F., P.M.2D.X., P.M.2), £3/5 (list £6/17/6).

READY RADIO Meteor "A" 3-valve Screen Grid Kit, complete with cabinet, M.C. speaker, less valves, £3/7/6; with 3 Mullard valves (P.M.12A., P.M.2D.X., P.M.2A.), £4/10 (list £8/7/6).

READY RADIO S.T.400 Kits, as specified by Scott Taggart, £2/19/6 each (list £4/17/6); Mullard Radio for Million 3-valve battery kits, complete with 3 Mullard valves, £3/3 (list £6/2/6), all kit new, in original sealed cartons.

B.T.H. Senior Pick-ups, 1934 model, with volume control, 28/- each (list 37/6); Marconi pick-ups, 1934 model No. 19, 25/- (list 32/6); H.M.V. volume controls, 1/6 each (list 12/6); Radiophone volume controls, with switch, 3/- each (list 10/6); Amplion loud-speaker units, 2/3 (list 12/6).

WE Have Purchased the Complete Liquidated Stock of a Large Northern Manufacturer and Factor, and can offer the following special bargains:—

DUBILIER 4 mfd. Condensers (2+1+1), 1,000 volt test, 2/9 each; 4.5 mfd., 1,000 volts test (2.25+2.25), 3/- each; mains switches, 3 amp. 250 volt, 8d. each, 7/6 dozen; Lumophon D.C. mains energised moving coil speakers, 6,500 ohms, with terminals, 11/6 each (listed 39/6); Pilco All-in-One radiometers, latest bakelite cased, 9/3 each (list 12/6); Ferrocart coils, F1, F2, and F3, G1, G2, and G3, 32/- per set; S.T.400 coils, 5/6 per pair; Kolster Brandes dual motors, for 100-250 volts, A.C. or clockwork, complete with all accessories and turntable, 25/- each (list 95/-); Edison plug-in inductance coils, all values from 20 upwards, centre tapped, 9d. each, 7/6 per dozen, assorted values; every article new.

ALL Goods Guaranteed and Sent Carriage Paid.

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SOUTHERN RADIO, 323, Euston Rd., London, N.W.1 (near Warren St. Tube). 'Phone: Museum 6324. [4069

EBURY BRIDGE RADIO Offer the Following Stupendous Bankrupt and Set Manufacturers' Surplus Bargains:—

A.C. H.T. Eliminators, 200-250v. output, 150v. 30 m.a., 3 pos. tappings (one continuously variable), Westinghouse rectified, finest components, 28/6; 2 pos. tappings (one continuously variable), 25/-, post 1/3.

D.C. H.T. Eliminators, 200-250v., output 150v. 30 m.a., 3 pos. taps (one continuously variable), 12/6; 2 pos taps (one continuously variable), 10/-, post 9d.

EX-MANUFACTURERS' Mains Transformers, suitable Ferrocart III tapped 200-250v., outputs 350-0-350v. 70-80 m.a., 4v. 2-3a., 4v. 3-4a. C.T., 9/6, post 9d.; a real snip.

EX-MANUFACTURERS' Heavy Duty Smoothing Chokes, 50h. at 50 m.a.; 5/6, post 6d.

PYE Mains Transformers, 200-250v., outputs 135v. 80-100 m.a., 4v. 4a. C.T.; 5/6, post 9d.

SPECIAL Offer Ebury Synchronous Electric Clock Movements, robust, reliable, 200-250v. 50c., 16/6, post 6d.; write full details.

CABINET Bargains, beautifully finished figured walnut, 17½×15½×8½, for mains set, or take set, speaker and batteries, brand new, unmarked; 12/6.

SMALLER Model, satin walnut, 16½×13×7½; 8/6 each, post 1/3; photos, stamp; bargains.

UTILITY 3-gang Condensers, new, split end vanes, separate trimmers, S.M. disc drive; 10/6, post 6d.

FINAL Clearance, Blue Spot, 100U, inductor speakers; list 39/6, 13/6; post 1/-.

SPECIAL Lotus Bargains, all new, boxed.—2-gang 0.0005, S.M., disc drive, dial light, escutcheon, split vanes, separate trimmers, screened, 8/6, post 9d., list 14/-; 0.0005 single, S.M. disc drive, dial light, escutcheon, 5/11, post 6d., list 9/6.

ILLUMINATED Disc Drives, fit any condenser, 2/11, post 3d., list 5/-; bakelite cased L.F. transformers, wonderful reproduction, 3-1 or 5-1; 3/11, post 4d.; list 5/6.

GOODMAN Dreadnought P.M. Moving Coil Speakers, 9in. cone, tapped transformer, powerful magnet; 21/-, post 1/3; list 39/6.

CONDENSER Bargains, all 250v. working.—T.C.C. 9 mfd (4+4+1), 3/6, post 6d.; Siemens 4 mfd., 2/-; Hydra 2 mfd., 1/4, post 4d.; Hellesen 8 mfd., electrolytic 3/9, post 3d.

ALL Goods 3 Days' Approval against Cash or c.o.d., your guarantee.

EBURY BRIDGE RADIO Co., 33, Ebury Bridge Rd., S.W.1 (near Victoria Station, No. 11 bus to Ebury Bridge). Sloane 8407. [4082

"The Wireless World" Diary for 1934 Price 1/6 By Post 1/7

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One Hundred Resistance Values from 50 ohms to 2 megohms. Each one a separate Colour Combination.

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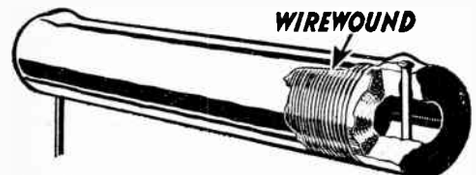

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Why have many set manufacturers chosen the Hywatt resistance for their 1934 sets? The answer's simple. The Hywatt is the most advanced resistance on the market: because—

1. The element is *wire*. This means (a) Much Closer tolerance than in the carbon type. (b) Fixed resistance value unchangeable in operation.
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Please write for folder, telling you all about the Hywatt, to—

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WatMel COMPONENTS GET THE BEST OUT OF ANY SET

C.R.C.94

Components, etc., for Sale.—Contd.

WEST END RADIO STORES.—A few more genuine bargains: N. and K. Farrand inductor speakers; 22/6, listed 70/-.

"FAY" Home Recorders, complete with diamond stylus, tracker, sound box, etc., 5/6; blank records, 6in. 2 9 per dozen, 8in. 5/6.

"FAY" Microphones, complete stand, transformer, battery, 18/9, listed at £3 3; genuine Reisz pattern microphones, 49/6.

MAINS Transformers.—Heayberd 209 250-0-250v. 50 m.a., 4v. 2a., 9 6; Heayberd 350-0-350 60 m.a., 4v. 4a., 4v. 2a., 6/6; H.T.8 200v. 180 m.a., 4v. 3a., 4v. 1a., 4/3; Edison Bell 400-0-400v. 120 m.a., 4v., 6v., and 7.5v., 12/6.

DUBILIER 4 mfd. Conds., tapped 2+1+1 mfd., 1,000v. test, 2/6; T.C.C. 8.25 mfd., tapped, 500v. test, 2 6.

MAGNAVOX 2,500 ohm D.C. Speakers (pentode), 17 6; Collard electric gramophone motors, 100-250 A.C., 35 -, listed £3.

HARLIE Pick-ups, new model, 12 6, with volume control; Bulgin eliminators, D.C. 16/6, A.C. 32 6; trickle chargers, 18 6, guaranteed 1 year; Post Office galvanometers, large type, 4 6.

WE Have a Large Assortment of Modern Walnut Radio and Radiogram Cabinets; postage extra on all orders by post.

WEST END RADIO STORES, 14, Lisle St., London, W.C.2, and at 382, Coldharbour Lane, Brixton, S.W. [4052

CONDENSER Microphones, with circuit diagram, £3 10; with amplifier, £7.—Dennis, 49, Church Lane, N.8. [4072

FERRANTI Flush Milliammeter, 0-8, with shunt 0-16, new; cost £2, 24/-. Temple, Knockdolian, Comrie, Perthshire. [4039

SAMSONS SURPLUS STORES Offer the Following Genuine Manufacturers' Surplus at Wonderful Bargain Prices:—

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MAINS Transformers.—B. & J. 350-0-350, 4v. 3, C.T., 4v. 4 C.T., 9/6; Tecalemit 350-0-350, 4v. 3 C.T., 4v. 4 C.T., 6/6; Pye, for Westinghouse H.T.7, 4v. 4 C.T., 5 6; Heayberd W.29, for H.T. 5 and 6, 4v. 4 C.T., 7/6; Marconi L.F. (new), 8-1, 7/6; Pye L.F. 707, 3.3-1, 4 6; Pye output, pentode or power, 3/11.

WEBSTER'S Automatic Record Changer, motor and pick-up, new, £6; Magnavox speakers, 2,000 ohms pentode, 17 6; 0.0005 Polar 4-gang condensers, less dial, 8 6.

CHOKES.—Pye 28 henrys 640 ohms, 3/3; 18 henrys 440 ohms, 2 11; 1½ henry 15 ohms, 2 6; Varley 3 henrys, 3/-; Igranic 8 henrys, 3/-.

UTILITY 3-gang, with disc drive split vanes, 9 6; Umello 5-valve transportable sets, 25/-; Ellis-wan talkie tone arms, 3/6; Pye ½ watt resistances, 6,000 and 10,000 ohms, Metro-Vic 15,000 ohms, 3d. each; wire-wound resistances, 25,000 ohms, 1/3; 50,000 ohms, 2 -; 120,000 ohms, 2/6.

ALL Goods Fully Guaranteed; postage extra on all goods.

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BARGAIN Two.—Westinghouse H.T.8, with screened primary, transformer having 4v. 3a., 4v. 1a., T.C.C., 4+6 mfd., 375 wkg.; the lot, 26 -.

BARGAIN Three.—Radiophone 27/6 straight 3-gang, with trimmers and dust cover; 12 6.

BARGAIN Four.—Set three Lotus screened coils for band pass, chassis type; 5/- set.

BARGAIN Five.—Lotus heavy duty 250 m.a. smoothing chokes, resistance 150 ohms, weight 4½lb.; 5/6, postage 1/-.

BARGAIN Six.—Six different Lotus wire wound resistances, 2 to 10 watt, 200 to 20,000 ohms; lot, 2/6.

BARGAIN Seven.—One each Hellesen 8 mfd. 435v. electrolytic, T.C.C., 50 mfd. 12v. and 6 mfd. 50v.; 4 3 lot.

BARGAIN Eight.—Famous Lorenz pick-up and tone arm and 6ft. Lewcos twin screened pick-up flex; 6 - the lot.

EIGHT out of Hundreds Similar Bargains at The Square Dealers, Birmingham Radiomart, John Bright St., Birmingham. [4065

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HEAYBERD L.T. Transformer, 4 volts, 10 amps., 7/6; choke, 30 henrys, 150 m.a., 5 -.—Tomlinson, Deansgrove, Haslingden. [4074

PEPPER'S Final Clearance Lists Now Available; all goods guaranteed; the following are only a few examples of our value:—

FERRANTI A.F.7, 15/-; O.P.1, 7 6; O.P.M.5, 9 11; Ferranti 3-gang condenser, as new, 19/6; A.F.15c, O.P.M.16c, for Class B, 15/- each.

MILNES H.T. Unit, good condition, cost £4/14; £1 19 6 carriage fwd.

MANY Other Bargains in our List.—Pepper, 575, Moseley Rd., Birmingham. [4071

1-WATT Carbon Resistances, 500 ohms to 1 megohm, 11d. 1/- dozen, plus postage; special for quantities.—54, Herne Hill Rd., S.E.24. [4035

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'SOUND' EQUIPMENT FOR ALL PURPOSES— FROM 2 TO 150 WATTS UNDISTORTED A.C. AMPLIFIERS, SPEAKERS, MICROPHONES, ETC.

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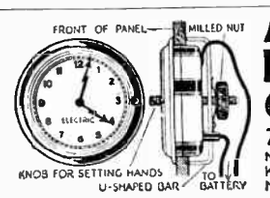

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Works on small battery lasting 12 months, or can be plugged into G.B. Battery without affecting reception. Uses practically no current. Fits into hole 3¼" dia. in any panel up to ½" thick. Easy to fix—no screws required. Only ⅞" from front of panel to back of case. Swiss movement. Hands set from front. Nickel plated bezel. Useful addition to any set.
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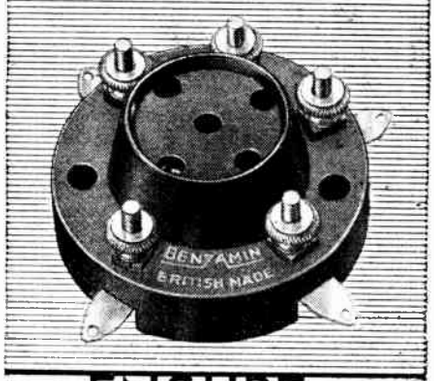

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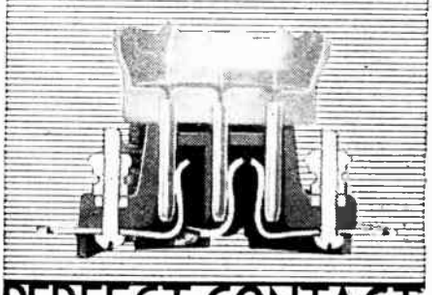

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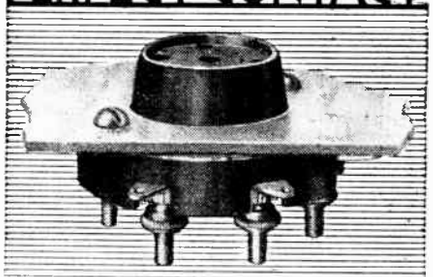

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The Benjamin 5-pin is a perfect masterpiece, bearing witness to the meticulous care and attention given to every little detail in its construction.

Examine the contacts; these are sprung in such a way as to ensure a maximum downward thrust on the valve pins, the main pressure being above the thick portion of the split valve leg, with the result that the valve snaps home in the holder—thus perfect contact is always maintained. The contacts, which are of course self cleaning, are taken through the body of the holder and form the solder tags. This one-piece solder tag and socket is just another Benjamin advantage.

In the lower illustration the terminals have been reversed and the valveholder is seen mounted flush beneath the baseboard. To allow for this flush mounting every terminal hole is countersunk to take the screw head on the terminal.

You pay no more for Benjamin superiority. The price of the 5-pin is 10d.

BENJAMIN

The Benjamin Electric Ltd., Tariff Road, Tottenham

Components, etc., for Sale.—Contd.

CHAL ELECTRIC Offers New Set Makers' Surplus, sealed cartons, guaranteed; all goods carriage paid; cash with order or c.o.d.

MOVING Coil Speakers.—Magnavox, 1933, type D.C.144, 2,500 or 6,500 ohms, listed 40/-, and 42/6, at 19/- each; type D.C.143, same voltages, listed 50/- and 52/6, at 26/- each; state if power or Pentode transformer; Rola's K type U.S.A. Junior 7½ cones, 2,000, 2,500, or 6,500 ohms at 18/-; Seniors, 9in. cones, same voltages, at 25/- each. Also number permanent magnets, with 7½ and 9in. cones, few duals and class B coils (3 each only). Ferrocart F.1, F.2, and F.3, or G.1, G.2, and G.3, at 32/- per set, ganged with switching; (300 only) specified coils for the S.T.400, pair 7/6; (200 only) Eston dual iron cored coils in cans, theoretical circuit enclosed for different circuits, at 5/- each; pick-ups, few only: 1933 Seniors, Marconiphone, 28/-; B.T.H., 2 guineas model, 28/-; Harlie, complete with volume control, list 27/6 at 15/-.

SMOOTHING Condensers: 800 test, 250 a.c., working, 1 mfd., 1/1; 2 mfd., 1/9; 4 mfd., 2/6; 1,500 test, 500 A.C. working, 1 mfd., 1/9; 2 mfd., 2/4; 4 mfd., 4/-; multiple banks, all separate tappings, 1,500 test, 5 mfd., 2+2+1 mfd. at 4/6, 11 mfd. 4+2+2+2+1 mfd. at 6/9, 20 mfd. 2+2+2+2+2+2+2+2+2+1+1 mfd. at 11/- each.

VARIABLE Condensers, all complete in sealed cartons, with covers, light, escutcheon, knob trimmers, disc drive, etc.: J.B. Nu Gang 2-gang, 9/6; 3-gang Nu Gang at 17/-; Polar Star 1933, 3 Star (ordinary), 17/-; Star (Super Het) at 17/-; Polar Star, 1933, Minors, 3-gang (ordinary), 16/-; 3 gang (Super Het) at 17/-; 2-gang at 10/-.—Chal Electric, No. 6, Conduit St., London, W.1. [4019

GILBERT INDUSTRIES Parcels and Components.—"A," "B" and "D" parcels still available by return (see issue October 6th).

OUR Famous 30 m.a. 150v. A.C. Eliminator Kit, complete in every detail, has now been redesigned with a still smarter case and heavier rectifier; price remains at 30/-, post paid, while supplies last.

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TWO Complete Portable Talkie Outfits, made by Associated Sound Equipments, sound on film, can be seen and heard working at the below address.

FOR Further Particulars of the Above Equipments, also variety of pull-through and driven sound-heads, first stage amplifiers, main amplifiers, P.A. amplifiers, photo cells, etc., apply for lists.

H. FRANKS, 42a, St. George St., Commercial Rd., London, E.1. 'Phone: Royal 8546. [4003

3D. per Week Secures Hamill's Patent Valve and Radio Tester; 1/- down, 3 monthly payments of 1/-.—Hamill, 23, Bede Crescent, Willington-on-Tyne. [3990

TRADERS, save time, order from the house who still specialise in kits and components, all kinds; catalogue 6d.—Perseus Radio, W.W., Burton-on-Trent. [0410

FERRANTI B2 Choke, 14/-; Ferranti A.F.7, 18/6; 2 Ferranti anode feed units, 2/6 each; R.I. pentamite choke, second-hand, 12/6.—24, Rookery Rd., Bristol. [4049

CINEMATOGRAPH Projectors, optical lanterns, films, slides, projection bulbs, lenses, spotlights; your inspection invited of big selection of bargains too numerous to list.

ILLUSTRA ENTERPRISES, 159, Wardour St. (facing Film House), London, W.1. 'Phone: Gerrard 6889. [3750

AMATEURS' Mikes, amplifiers, short wave transmitting, receiving; write lists; A.F.5 c.c., 17/6; A.F.5 c.s., 20/-; A.F.5, 14/-; O.P. c25, 9/-; D.O.25s, 15/-.—Gardner, The Rock, Birchington, Kent. [4041

FERRANTI O.P.M.1, 9/-; O.P.M.1c, 10/-; O.P.M.2c, 10/-; A.F.5c 15/6. Varley double tapped secondary P.P. transformer, 16/6; Macnamara walnut cabinet, 8/6; all goods guaranteed.—Wiggan, 14, Bent St., Brierley Hill, Staffs. [4076

MARCONI Eliminator, D.C.7, 180v, 60 m.a., 30/-; A.M.7 H.T. and L.T., with valve, 65/-; Ekco D.C. 150v, 20 m.a., 12/6; Magnavox D.C.143, 7,500 ohms (3 ratio), 27/6; Ferranti A.F.15c, new, 20/-; all perfect.—72, Howard Rd., E.17. [4080

SEE Modern Radio's advert. in last week's issue for some of the Best Bargains in These Columns. On page 21, top left-hand corner. This week we offer ex R.A.F. smoothing condensers, all tested before despatch, tested to 4,000 volts D.C. working, voltage 2,000, 6/6 each.

A FEW Fay Microphones Still Available, complete with stand, transformer and battery, a very sensitive model, with 3-point spring suspension, all new and boxed; 18/9.

FAY Acoustic Model Home Recorders, new and boxed, complete with cutting needle and tracking arm, 5/6; records for same, 5/- per dozen.

ALL Goods in Perfect Order; despatched post free and by return.—Modern Radio, 25, York Terrace, Clapham, S.W.4. Callers only to Modern Radio, 37, Lisle St., Leicester Sq., W.C.2. [4079

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TWO-INCH Spark Coils, 17/6; one-inch, 6/6; G.P.O. wall telephones, magneto ringing, 12/6; microphones, 4/6, 2/6 and 1/-; microphone transformers, 2/6; and other telephone gear.—Below.

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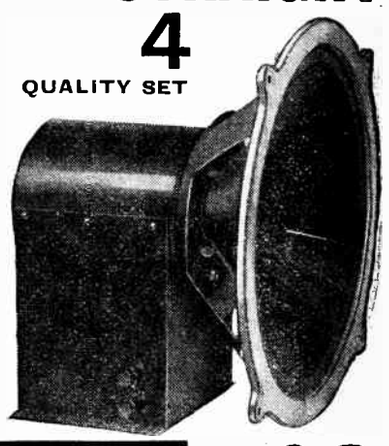

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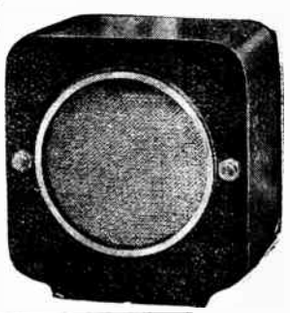

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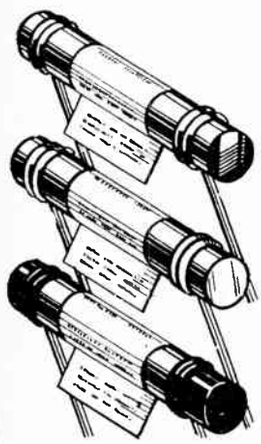

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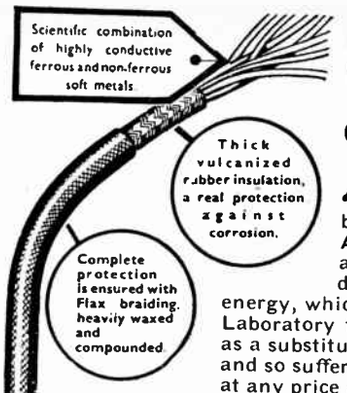

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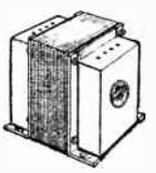

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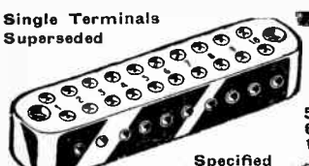

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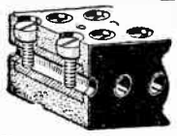

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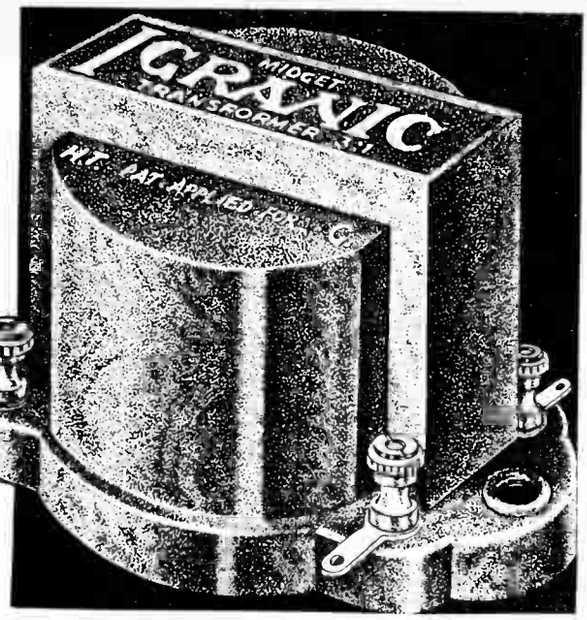

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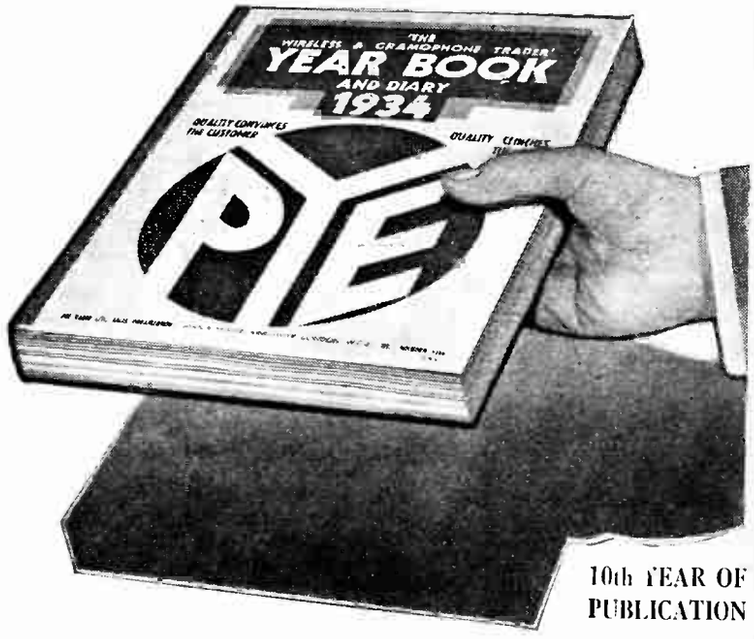

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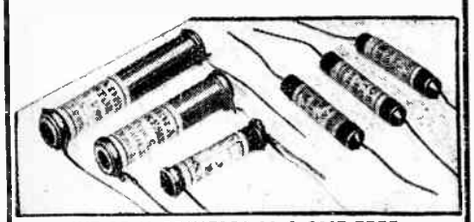

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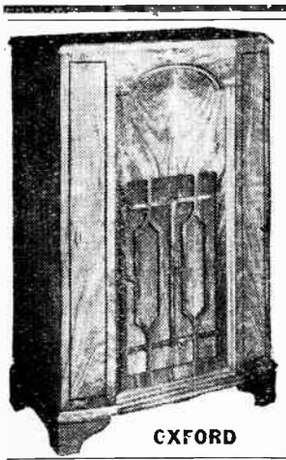

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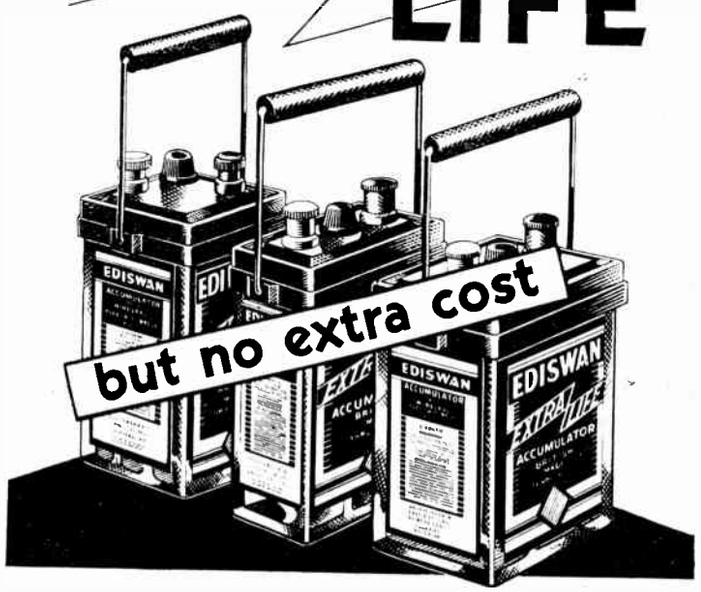

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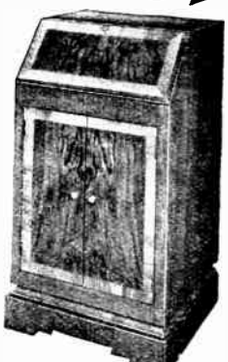

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